

Mathematics

8th GRADE CORE OUTCOMES

Develop number and number relationships with integers, rational and irrational numbers

Use computation and estimation strategies with rational numbers and integers

Demonstrate an understanding of simple Algebraic Concepts

Use Elementary Statistics and Probability to analyze Data

Explore Geometry and measurement in two and three dimensions

Mathematics

GRADE 8 CORE

Develop number and number relationships with integers, rational and irrational numbers

Initial Understanding

- Rename equivalent fractions and mixed numbers as equivalent decimals and vice versa.
- Rename fractions and decimals as equivalent percents & vice versa or state rules for given pattern
- Write equivalent fractions and determine whether fractions are equivalent.
- Find percent of a number
- Order and Compare whole numbers, fractions and decimals, integers and irrational numbers
- Describe the absolute value of a numbers
- Describe magnitude of fractions, mixed numbers and decimals
- Round whole numbers, fractions and decimals in context

Developing an Interpretation

- Write factors and multiples of a number
- Decide whether a number is prime or composite.
- Write the prime factorization of a number.
- Find greatest common factor of a number
- Find the least common multiple of numbers.
- Identify alternative forms of expressing numbers using scientific notation
- Locate points on lines, scales, integers, rational, and irrational numbers.

Use computation and estimation strategies with rational numbers and integers

Initial Understanding

- Write and interpret, numbers using exponential notation
- Multiply and divide numbers using exponential notation
- Add integers. Subtract integers, multiply integers and find integer quotients.
- Add and subtract rational numbers with like unlike denominators.
- Multiply and divide rational numbers expressed as a fractions and a mixed #
- Find the quotient of two numbers expressed with negative exponents.

Developing an Interpretation

- Estimate whole number sums and differences by using rounding and front-end estimation.
- Use strategies, to solve problems with numbers and variables

Developing an Interpretation

- Use Make a Table, Look for a Pattern, to solve problems.

Making Connections

- Solve problems involving: $0.1/0.01$ more/less.
- Solve word problems involving numbers
- Solve non-routine problems using the strategies choose the operation of Guess, Check, Revise.
- Solve problems using the strategy Draw a Diagram.
- Solve problems, using metric units.
- Solve problems, using the strategy make an Organized List.
- Solve problems using Logical
- Solve word problems by writing and solving equations
- Estimate decimal sums, differences, products and quotients, by rounding.
- Estimate a reasonable answer to a problem

Critical Stance

- Estimate to make and defend a decision.

Develop Algebraic Concepts

Initial Understanding

- Evaluate numerical and algebraic expressions.
- Use order of operations to evaluate expressions.
- Write a rule that represents the relationship between two numbers
- Translate a verbal phrase to a numerical or algebraic expression.
- Use the basic properties of addition to write algebraic expression equivalent to another expression
- Use the basic properties of multiplication to write and algebraic expression equivalent to another expression.
- Use the Associative and Distributive properties to simplify expressions.
- Solve equations for a replacement set.
- Solve equations using the multiplicative inverse.
- Use mental math or Guess, Check, Revise to solve equation
- Use addition and subtraction to solve equation
- Use multiplication and division to solve equations
- Evaluate formulas
- Use addition subtraction, multiplication and division to solve equations with integers
- Translate verbal statements into equations
- Write and interpret, variables using exponential notation
- Multiply and divide variables using exponential notation
- Graph an ordered pair on the coordinate plane.
- Use divisibility rule

Developing an Interpretation

- Describe the relationship between two variables in words
- Describe the relationship between two variables graphically.
- Translate verbal statements into equations.
- Identify or extend patterns involving numbers and attributes

Making Connections

- Solve equations involving more than one operation
- Solve word problems by writing and solving equations
- Graph simple linear equations using slope intercept
- Write formula for given pattern

Use Elementary Statistics and Probability to analyze Data

Initial Understanding

- Identify correct information: graphs, tables, charts.
- Create graphs from data: tables and charts.

Developing an Interpretation

- Draw and justify reasonable conclusions from graphs, tables, charts.
- Make frequency tables for sets of data to find range and mode
- Solve problems involving means and medians of sets of data.
- Construct and interpret stem-and -leaf diagrams.
- Recognize positive and negative correlations in scatter plots.
- Analyze scatter plots.

Making Connections

- Find the probability of simple events and mutually exclusive events.
- Distinguish between and calculate the probability of independent dependent events.
- Use probability to decided if a game is fair

Explore Geometry and measurement in two and three

Initial Understanding

- Classify polygons by name.
- Measure of vertical and corresponding angles
- Find the circumference, radius, or diameter of a circle.
- Find the area of rectangles and parallelograms.
- Find the area of triangles and trapezoids.
- Find the area of circles.
- Use the Pythagorean Theorem to find lengths of sides of a right triangle.
- Determine volume of rectangular prisms

Developing an Interpretation

- Estimate lengths, area, and angle measurement.

Critical Stance

In Mathematics justifying, proving or explaining a conjecture or answer is connected to the learning Environment. Students are encouraged and expected to question one another's ideas and to explain and support their own ideas in the face of others' challenges. Each objective in mathematics can be framed to have students defend support, explain or prove their answer. To understand what they learn, students must enact for themselves verbs that permeate the mathematics curriculum: "examine", "represent", "transform", "solve", "apply", "and prove".

Mathematics

OUTCOMES

Grade 8

Algebra 1 Part A (Full Year)

Demonstrate number sense strategies with rational numbers.

Develop number and number relationships with integers, absolute value, rational and irrational numbers.

Use properties of mathematics to understand Algebra

Evaluate variables using equations and inequalities

Interpret and analyze data using statistical techniques

Evaluate variables using simple probability

Use functions relationships to investigate problems

Use graphs to demonstrate a visual representation of Algebraic Concepts

Mathematics

Grade 8 Algebra 1 Part A (Full Year)

Demonstrate number sense strategies with rational numbers

Initial Understanding

- Skip counting (3, 4, 5, 6, 7, 8, 9)
- Doubles in addition and multiplication
- Making a ten
- Divisibility of whole numbers.
- Factors and Prime numbers
- Fractions for numbers between 1 and 0 and greater than 1
- Picturing a fraction
- Placing a fraction on a number line
- Order, estimating, and comparing fractions
- Using the multiplication of one to add, subtract, multiply and divide fractions

Develop number and number relationships with integers, absolute value, rational and irrational numbers

Developing an Interpretation

- Represent problem situations as equations and solve.
- Represent linear patterns with equations.
- Represent linear equations with graphs.

Making Connections

- Compare real numbers
- Find equivalence among fractions, decimals and percents

Critical Stance

- Make predictions by identify patterns in a number sequence
- Predict line of best fit interpret data in scatter plot.

Use properties of mathematics to understand Algebra

Developing an Interpretation

- Define property of zero.

Making Connections

- Apply Commutative, Associative and Distributive properties to Algebraic Concepts
- Use the Distributive property to simplify expressions.

Evaluate variables using equations and inequalities

Initial Understanding

- Multiply and divide expressions that contain variables
- Solve equations using addition and subtraction
- Solve equations using multiplication and division.
- Solve inequalities using addition and subtraction
- Solve inequalities using multiplication and division.

Developing an Interpretation

- Solve multi-step equation.
- Solve Literal equations for a variable.
- Solve multi-step inequalities
- Solve compound inequalities.
- Solve absolute value equations and inequalities

Making Connections

- Use equations to solve real world multi-step problems.
- Use the Distributive property to solve equations.
- Use formulas to solve problems.
- Use proportions to solve problems.

Interpret and analyze data using statistical techniques

Initial Understanding

Find mean, median, mode and range.

Developing an Interpretation

Interpret and analyze bar and circle graphs.

Represent and interpret stem-and-leaf plots, histograms and box, and whisker plots

Evaluate variables using simple probability

Making Connections

Find the experimental probability that an event will occur.

Use functions relationships to investigate problems

Describe the range and domain of a relation or function justify its designation

Use graphs to demonstrate a visual representation of Algebraic Concepts

Initial Understanding

Calculate the slope of a line.

Making Connections

Use the slope intercept formula to graph a linear function

Use the standard and point-slope form to graph linear equations

Critical Stance

Prove lines are parallel or perpendicular using slope

Critical Stance

In Mathematics justifying, proving or explaining a conjecture or answer is connected to the learning environment. Students are encouraged and expected to question one another's ideas and to explain and support their own ideas in the face of others' challenges. Each objective in mathematics can be framed to have students defend, support, explain or prove their answer. To understand what they learn, students must enact for themselves verbs that permeate the mathematics curriculum: "examine", "represent", "transform", "solve", "apply", and "prove".

Mathematics

OUTCOMES 8th Grade Algebra

Develop number and number relationships with integers, absolute value, rational and irrational numbers.

Use properties of mathematics to understand Algebra

Evaluate variables using equations and inequalities

Interpret and analyze data using statistical techniques

Investigate real world problems by using problem solving techniques

Evaluate variables using simple probability

Use functions relationships to investigate problems

Use graphs to demonstrate a visual representation of Algebraic Concepts

Exploring operations on polynomials

Mathematics

8TH GRADE ALGEBRA 1

Developing and understanding of number and variables relationships with integers, absolute value, rational and irrational numbers

Initial Understanding

- Apply order of operations
- Plot points on a coordinate plain
- Simplify expressions with opposites and absolute value.
- Multiply and divide positive and negative numbers
- Define exponents and powers.
- Simplify products of a monomial
- Simplify quotients of a power.
- Simplify powers of a fraction
- Identify or estimate the value of a square root
- Simplify square roots
- Perform mathematical operations with radicals

Developing an Interpretation

- Represent problem situations as equations and solve.
- Represent linear patterns with equations.
- Represent linear equations with graphs.
- Solve expressions that contain zero and negative exponents

Making Connections

- Compare real numbers
- Find equivalence among fractions, decimals and percents
- Find products of powers
- Find powers of a power
- Find the power of a product

Critical Stance

- Justify why you use scientific notation to represent large and small numbers.
- Make predictions by identify patterns in a number sequence

Use properties of mathematics to understand Algebra

Developing an Interpretation

- Define property of zero.

Making Connections

- Apply Commutative, Associative and Distributive properties to Algebraic Concepts
- Use the Distributive property to simplify expressions.

Evaluate variables using equations and inequalities

Initial Understanding

- Multiply and divide expressions that contain variables
- Use addition and subtraction to Solve equations
- Use multiplication and division to solve equations
- Use addition and subtraction to Solve inequalities
- Use multiplication and division to solve inequalities

Developing an Interpretation

- Solve multi-step equation.
- Solve Literal equations for a variable.
- Solve multi-step inequalities
- Solve compound inequalities.
- Solve absolute value equations and inequalities
- Solve equations containing radicals
- Solve equations by using radicals
- Solve quadratic equations by factoring

Making Connections

- Use the Distributive property to solve equations.
- Find solutions to systems of linear equations by the substitution method
- Find solutions to systems of linear equations by the elimination method.
- Use the quadratic formula to find the roots of a quadratic equation
- Use the quadratic formula to find the zeros of a quadratic function.
- Evaluate the discriminate to find how many real roots a function has

Investigate real world problems by using problem solving techniques

Making Connections

- Use equations to solve real world multi-step problems
- Use formulas to solve problems.
- Use proportions to solve problems.

Critical Stance

- Solve and justify Puzzles problems in two variables.

Interpret and analyze data using statistical techniques

Initial Understanding

- Find mean, median, mode and range.

Developing an Interpretation

- Interpret and analyze bar and circle graphs.
- Represent and interpret stem-and-leaf plots, histograms and box, and whisker plots

Critical Stance

- Predict line of best fit interpret data in scatter plot and.

Evaluate variables using simple probability

Making Connections

- Find the experimental probability that an event will occur.

Use functions relationships to investigate problems

Initial Understanding

- Describe the range and domain of a relation or function.

Critical Stance

- Justify the designation of a function or relation

Use graphs to demonstrate a visual representation of Algebraic Concepts

Initial Understanding

- Calculate the slope of a line.

Making Connections

- Use the slope intercepts formula to graph a linear function
- Use the standard and point -slope form to graph linear equations

Critical Stance

- Prove lines are parallel or perpendicular using slope

Exploring operations on polynomials

Developing an Interpretation

Find the product of a binomial by using the Distributive Property

Find the product of a binomial by using the Foil Method.

Making Connections

Factor a polynomial by finding and using the greatest common factor.

Factor a polynomial by finding and using a binomial factor

Factor finding perfect square trinomials.

Factor a polynomial by finding and using the difference of two squares.