

Introduction to Algebra and Geometry Course Outline

Unit One: Data Analysis

(This unit covers standards E.8.1, E.8.2, E.8.3, E.8.5)

- A. Line Plots
- B. Stem-and-Leaf Plots (single and back-to-back)
- C. Basic Statistics
 - 1. Mean
 - 2. Median
 - 3. Mode
 - 4. Range
 - 5. Outliers
- D. Box-and-Whisker Plots
 - 1. Creating
 - 2. Using more than one to compare sets of data
- E. Bar and Line Graphs
- F. Scatter Plots
 - 1. Create
 - 2. Discover correlation
 - 3. Manually draw a best-fit line

Unit Two: Integers

(This unit covers standards B.8.1 and B.8.2)

- A. Absolute value
- B. Add, subtract, multiply, and divide integers
- C. Evaluate expressions with integers
- D. Using integers to plot points
- E. Exponents
- F. Scientific Notation
 - 1. Positive exponents
 - 2. Negative exponents

Unit Three: Language of Algebra

(This unit covers standards F.8.1, F.8.3, and F.8.4)

- A. Formulas and Variables
- B. Algebraic expressions
- C. Writing expressions and equations
- D. Solving equations
 - 1. Add, subtract, multiply, and divide
- E. Solving two step equations
- F. Solving inequalities

Unit Four: Linear Equations and Inequalities

(This unit covers standards C.8.5, F.8.2, F.8.4)

- A. Understanding two variable relationships
- B. Solutions of two variable equations
- C. Graphing two variable equations
- D. Understanding slope
 - 1. Calculate slope
 - 2. Interpret slope
- E. Patterns between equations and graphs
- F. Solving systems of linear equations
 - 3. Graphically
 - 4. Substitution
- G. Linear inequalities

Unit Five: Ratio and Proportions

(This unit covers standards B.8.4 and B.8.5)

- A. Estimating ratios and rates
- B. Proportions
- C. Relating proportions and linear equations
- D. Solving proportions
- E. Using and calculating unit rates
- F. Using rates and proportions to solve problems
- G. Using ratios to investigate scale drawings and models

Unit Six: Percent

(This unit covers standards B.8.1, B.8.3, and B.8.5)

- A. Converting between percents, decimals, and fractions
- B. Solving percent problems
- C. Estimating percents
- D. Percent increase and decrease
- E. Using percent change to solve

Unit Seven: Number Theory

(This unit covers standards B.8.2, B.8.4, and B.8.6)

- A. Divisibility tests
- B. Prime and composite numbers
- C. Prime factorizations
- D. Finding greatest common factor
- E. Finding least common multiple
- F. Defining rational numbers
- G. Add, subtract, multiply, and divide rational numbers
- H. Perfect squares and square roots
- I. Square roots and irrational numbers
- J. Pythagorean Theorem

VIII. Geometry and Measurement

(This unit covers standards D.8.2, D.8.3, and D.8.4)

- A. Units of measurement
- B. Significant digits and precision
- C. Lines and angles
- D. Parallel and perpendicular lines
- E. Polygons
- F. 3D views

IX. Area and Volume

(This unit covers standards C.8.1, C.8.2, D.8.1, and D.8.4)

- A. Perimeter and area of polygons
- B. Scale and area
- C. Circles
- D. Surface areas of prisms and cylinders)
- E. Surface area of pyramids and cones
- F. Volume of rectangular prisms
- G. Scale and volume
- H. Volume of prisms and cylinders
- I. Volume of pyramids and cones

X. Functions and Relations

(This unit covers standard F.8.1)

- A. Functions
- B. Linear Functions
- C. Quadratic Functions
- D. Other Functions
- E. Polynomials
 - 1. Adding and subtracting polynomials
- F. Multiplying monomials
- G. Multiplying polynomials

XI. Similarity, Congruence, and Transformations

(This unit covers standard C.8.4)

- A. Similar Figures
- B. Congruent Figures
- C. Triangle congruence
- D. Trigonometry
- E. Indirect measurement
- F. Transformations and Congruence
- G. Transformations and Similarity
- H. Symmetry

XII. Counting and Probability

(This unit covers standard E.8.7)

- A. Tree diagrams and counting principle
- B. Permutations and arrangements
- C. Combinations and groups
- D. Probability
- E. Experimental and geometric probability
- F. Conditional probability
- G. Dependent and independent events