

Math 8A

SCOPE OF COURSE

This course is divided into two semesters of study (A & B) comprised of five units each. The first-semester (A) is a study of real numbers; algebraic expressions; factoring, linear equations, and inequalities; functions and systems; and probability and statistics.

SEQUENCE OF SKILLS

UNIT 1 – Real Numbers

- Natural numbers, whole numbers, and integers
- Rational numbers
- Perfect squares, radicals, and irrational numbers
- Rational vs. Irrational numbers
- Prime and composite numbers
- Fractions and number sense
- Operations with fractions
- Decimals
- Scientific notation and percent
- Properties of real numbers
- Absolute value
- Prime factorization
- Estimation
- Problem solving

UNIT 2 – Algebraic Expressions

- Writing algebraic expressions
- Polynomials
- Combining like terms
- Adding and subtracting polynomials
- Algebraic expressions with exponents
- More on algebraic expressions with exponents
- Negative exponents
- Order of operations
- Evaluating algebraic expressions
- Multiplication of polynomials
- Multiplication of binomials
- Special binomial products
- Division of polynomials
- Applications of polynomials

UNIT 3 – Factoring, Linear Equations, and Inequalities

- Common factors
- Factoring trinomials
- Factoring the difference of two squares
- Factoring- mixed review
- One-step equations
- Two-step equations
- Multi-step equations
- Writing equations
- Literal equations
- Word problems
- Proportions
- Patterns and formulas
- Linear and non-linear relationships
- Inequalities

Math 8A

SEQUENCE OF SKILLS

UNIT 4 – Functions and Systems

- Relations and functions
- Functional notation
- Graphing
- Slope of a line
- Intercepts
- Linear functions
- Slope-intercept form
- Applications of slope and intercepts
- Systems of equations – graphing
- Systems of equations – substitution method
- Systems of equations – elimination method
- Graphing inequalities
- Systems of inequalities
- Introduction to quadratic functions

UNIT 5 – Probability and Statistics

- Independent and dependent events
- Simple and compound events
- Mutually exclusive and complementary events
- Tree diagrams and multistage experiments
- Experimental probabilities and simulations
- Odds and counting principles
- Line plots and stem and leaf plots
- Scatter plots and line of best fit
- Bar graphs and histograms
- Line graphs and pictographs
- Circle graphs
- Measures of central tendency
- Box and whisker plots
- Venn diagrams

Math 8B

SCOPE OF COURSE

This course is divided into two semesters of study (A & B) comprised of five units each. The second-semester (B) is a study of angles and polygons; coordinate geometry, circles, and graph theory; transformational geometry; measurement; and logic.

SEQUENCE OF SKILLS

UNIT 1 – Angles and Polygons

- Points, lines, and planes
- Line segments, rays, and angles
- Plane geometry
- Complementary and supplementary angles
- Vertical angles
- Transversals and parallel lines
- Triangles
- Isosceles and equilateral triangles
- The Pythagorean Theorem
- The triangle inequality
- Quadrilaterals
- Parallelograms
- Polygons
- Regular polygons

UNIT 2 – Coordinate Geometry, Circles, and Graph Theory

- The coordinate plane
- Slope
- Rates of change
- Midpoint
- Distance
- Applications of coordinate geometry
- Circles
- Circles, tangents, and secants
- Circles and inscribed angles
- Locus of points
- Introduction to graph theory
- Euler paths and circuits
- Hamilton paths and circuits
- Cartography

UNIT 3 – Transformational Geometry

- Transformations
- Translations
- Reflections
- Rotations
- Dilations
- Congruent figures
- Similar figures
- Applications of similar figures
- Tessellations with polygons
- Combinations of transformations
- Isometries
- Symmetry
- Introduction to constructions
- Triangle constructions

Math 8B

SEQUENCE OF SKILLS

UNIT 4 – Measurement

- Perimeter
- Area
- Connection between perimeter and area
- Area of a parallelogram
- Area of a triangle
- Area of a trapezoid
- Classification of solids
- Nets, and three-dimensional figures
- Volume of rectangular prisms
- Volume of cylinders and cones
- Surface area
- Effects of changing dimensions
- Measurement – conversions
- Measurement – estimation and accuracy

UNIT 5 – Logic

- Statements and their negations
- Conjunctions
- Disjunctions
- Conditional statements
- More on logic statements
- The converse of a statement
- The inverse of a statement
- Contrapositives and logically equivalent statements
- Review of conditionals
- Biconditional statements
- Deduction
- Induction
- Logic puzzles
- Advanced logic puzzles