Based on the NCTM Curricular Focal Points, Math Foundations II is designed to expedite student progress in acquiring 6th- to 8th-grade skills. The course is appropriate for use as remediation at the high school level or as middle school curriculum. The program simultaneously builds the computational skills and conceptual understanding needed to undertake high school-level math courses with confidence.

The course's carefully paced, guided instruction is accompanied by interactive practice that is engaging and accessible. Formative assessments help students to understand areas of weakness and improve performance, while summative assessments chart progress and skill development. Early in the course, students develop general strategies for honing their problem-solving skills. Subsequent units provide a problem-solving strand that asks students to practice applying specific math skills to a variety of real-world contexts.

This course is built to state standards and informed by the National Council of Teachers of Math (NCTM) standards and Curricular Focal Points for Prekindergarten through Grade 8 Mathematics: A Quest for Coherence.

Length: Two Semesters

Unit 1: Functions

- What Is a Function?
- Graphing Functions
- Linear Functions
- Linear Equations and Inequalities
- Linear Systems
- Linear and Nonlinear Functions
- Linear and Exponential Growth
- Arithmetic of Functions
- Functions Wrap-Up

Unit 2: Exponential Functions

- Types of Numbers
- Exponents
- Exponential Functions
- Graphs of Exponential Functions
- Exponents and Exponential Functions Wrap-Up

Unit 3: Polynomials

- What Is a Polynomial?
- Adding and Subtracting Polynomials
- Multiplying Binomials
- Multiplying Polynomials

Copyright© Edmentum Inc. All Rights Reserved.

- Dividing Polynomials
- Polynomials Wrap-Up

Unit 4: Factoring Polynomials

- GCF and Factoring by Grouping
- Factoring x² + bx + c
- Factoring ax² + bx + c
- Special Cases
- Factoring and Graphing
- Factoring Polynomials Wrap-Up

Unit 5: Quadratic Equations and Functions

- Solving Quadratic Equations
- Completing the Square
- The Quadratic Formula
- Graphs of Quadratic Functions
- Working with Complex Numbers
- Nonlinear Systems of Equations
- Linear, Quadratic, and Exponential Functions
- Quadratic Equations and Functions Wrap-Up

Unit 6: Undoing Functions and Moving Them Around

- Literal Equations
- Inverses
- Parent Functions
- Shifting Functions
- Stretching and Compressing Functions
- Transformations of Parent Functions
- Undoing Functions and Moving Them Around Wrap-Up

Unit 7: Applications of Probability

- What Is Probability?
- Counting Principles
- Permutations and Combinations
- Basic Rules of Probability
- Geometric Models for Probability
- Conditional Probability
- Independence
- Simulations
- Applications of Probability Wrap-Up

Unit 8: Semester 1 Exam

Unit 9: Preparing for Proofs

- Induction: The Search for Rules and Patterns
- Deduction: Making a Case

Copyright© Edmentum Inc. All Rights Reserved.

- The Look and Language of Logic
- Introduction to Proofs
- Basic Postulates in Geometry
- Planes and the Space of Geometry
- Intersecting Lines and Proofs
- Parallel Lines and Proofs
- Preparing for Proofs Wrap-Up

Unit 10: Triangles

- What Is a Triangle?
- The Angles of a Triangle
- Congruence
- Congruence Postulates
- Proofs of Congruence
- Similar Triangles
- Similarity Theorems and Proportional Reasoning
- Triangle Theorems
- Medians and Altitudes
- Bisectors and Midsegments
- Triangles Wrap-Up

Unit 11: Right Triangles and Trigonometry

- The Pythagorean Theorem
- Congruent Right Triangles
- Similar Right Triangles
- Special Right Triangles
- Trigonometric Ratios
- Trigonometric Ratios and the Unit Circle
- Right Triangles and Trigonometry Wrap-Up

Unit 12: Quadrilaterals and Other Polygons

- Angle Sums of a Polygon and Proofs
- Parallelograms and Proofs
- Tests for Parallelograms
- Rectangles
- Rhombi and Squares
- Trapezoids
- Quadrilaterals and Other Polygons Wrap-Up

Unit 13: Circles Without Coordinates

- What Is a Circle?
- Chords
- Arcs
- Chord and Arc Relationships
- Circles, Angles, and Proofs

Copyright© Edmentum Inc. All Rights Reserved.

- Secants, Tangents, and Proofs
- Circumference and Arc Length
- Area and Sectors
- Circles and Triangles
- Circles and Polygons
- Circles Without Coordinates Wrap-Up

Unit 14: Conic Sections

- From Lines to Conic Sections
- Geometry of Conic Sections
- Midpoint Formula
- The Distance Formula
- Circles with Coordinates and Proofs
- Parabolas
- Locus of Points
- Conic Sections Wrap-Up

Unit 15: Three-Dimensional Solids

- What Is a Polyhedron?
- Cylinders and Cones
- Platonic Solids
- Surface Area
- Volume
- Spheres
- Similar Solids
- Three-Dimensional Solids Wrap-Up

Unit 16: Semester 2 Exam

Copyright© Edmentum Inc. All Rights Reserved.