

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: INTRODUCTION TO PROBLEM SOLVING

- Lesson 1: Building Basic Word Problems
- Lesson 2: A Four-Step Approach
- Lesson 3: Too Much or Too Little Information
- Lesson 4: Draw a Diagram
- Lesson 5: Use a Model or Act it Out
- Lesson 6: Make a List
- Lesson 7: Build a Chart and Find a Pattern
- Lesson 8: Guess and Check
- Lesson 9: Work Backward
- Lesson 10: Introduction to Problem Solving Wrap-Up

### UNIT 2: THE LANGUAGE OF ALGEBRA

- Lesson 1: What is a Variable?
- Lesson 2: Finding and Naming Variables
- Lesson 3: Measurement and Units
- Lesson 4: Graphs, Tables, and Equations
- Lesson 5: Solving Problems with Tables and Graphs
- Lesson 6: Variable Expressions
- Lesson 7: Simplifying and Evaluating Expressions
- Lesson 8: Mathematical Sentences
- Lesson 9: Solving Mathematical Sentences
- Lesson 10: Some Guidelines for Problem Solving
- Lesson 11: The Language of Algebra Wrap-Up

### UNIT 3: SOLVING EQUATIONS WITH FOUR BASIC OPERATIONS

- Lesson 1: Solving Equations Graphically
- Lesson 2: Solving Equations with Larger Numbers
- Lesson 3: Solving  $x + a = b$
- Lesson 4: Solving with a Number Line
- Lesson 5: Solving Inequalities
- Lesson 6: Solving  $ax = b$

- Lesson 7: Solving  $x/a = b$
- Lesson 8: Inequalities
- Lesson 9: Variations of Equations and Inequalities
- Lesson 10: Solving Multistep Linear Equations
- Lesson 11: Literal Equations
- Lesson 12: Solving Equations with Four Basic Operations Wrap-Up

## UNIT 4: FUNCTIONS

- Lesson 1: Domain and Range
- Lesson 2: Identifying Functions
- Lesson 3: Graphs of Functions
- Lesson 4: Adding and Subtracting Functions
- Lesson 5: Functions Wrap-Up

## UNIT 5: SEMESTER 1 EXAM

- Lesson 1: Semester 1 Review and Exam

## UNIT 6: USING LOGIC TO SOLVE PROBLEMS

- Lesson 1: Building Equations
- Lesson 2: Deductive Reasoning
- Lesson 3: Inductive Reasoning
- Lesson 4: Logic Puzzles
- Lesson 5: Problem Solving
- Lesson 6: Using Logic to Solve Problems Wrap-Up

## UNIT 7: LINEAR EQUATIONS

- Lesson 1: Slope
- Lesson 2: Slope-Intercept Equation of a Line
- Lesson 3: Point-Slope Equation of a Line
- Lesson 4: Parallel and Perpendicular Lines
- Lesson 5: Linear Inequalities
- Lesson 6: Linear Equations Wrap-Up

## UNIT 8: SYSTEMS OF LINEAR EQUATIONS

- Lesson 1: Two-Variable Systems: Graphing
- Lesson 2: Two-Variable Systems: Substitution
- Lesson 3: Two-Variable Systems: Elimination
- Lesson 4: Two-Variable Systems of Inequalities
- Lesson 5: Systems of Linear Equations Wrap-Up

## UNIT 9: EXPONENTS AND EXPONENTIAL FUNCTIONS

- Lesson 1: Definitions and Examples of Exponents
- Lesson 2: Exponents and the Order of Operations
- Lesson 3: Laws of Exponents
- Lesson 4: Square Roots
- Lesson 5: Radical Notation
- Lesson 6: Exponential Functions
- Lesson 7: Graphs of Exponential Functions
- Lesson 8: Exponents and Exponential Functions Wrap-Up

## UNIT 10: UNDOING FUNCTIONS AND MOVING THEM AROUND

- Lesson 1: Parent Functions

- Lesson 2: Shifting Functions
- Lesson 3: Stretching and Compressing Functions
- Lesson 4: Transformations of Parent Functions
- Lesson 5: Undoing Functions and Moving Them Around Wrap-Up

## **UNIT 11: SEQUENCES AND FUNCTIONS**

- Lesson 1: Arithmetic Sequences
- Lesson 2: Geometric Sequences
- Lesson 3: Understanding Number Sequences
- Lesson 4: Exponential and Linear Growth
- Lesson 5: Sequences and Functions Wrap-Up

## **UNIT 12: SEMESTER 2 EXAM**

- Lesson 1: Semester 2 Review and Exam