
Essential Math 1B

Course Description

Essential Math 1B completes the series of five units designed to help students to master basic mathematical concepts. In conjunction with the Essential Math 1A course, Essential Math 1B helps prepare students to advance to higher-level math courses and assists students with credit remediation.

- The **Measurement and Geometry** unit concentrates on measurement conversion and the solving of geometric figures, and how the application of these basic skills to other areas of mathematics and day-to-day life is fundamental to architecture, landscaping, computer graphics, and art careers. In-depth understanding of these math components lays a foundation for future studies in calculus and other high-level mathematics.
- The **Algebra 1** unit expands students' basic algebra skills that will be important in gaining access to college and to math, technical, and science careers.

Learning is enhanced by the interactive components within each topic. Students can observe and listen as step-by-step examples of key concepts are presented on a virtual blackboard, and students get additional hands-on practice through interactive geometry software as well as "Math Demos" via external links. One topic in the course is devoted to test-taking strategies.

Reading and writing skills are incorporated throughout the course as students participate in discussion groups, complete mathematical reasoning assignments, and explore mathematical websites. In addition, "Real World Connection" problems help students relate their learning to real-life experiences, and require them to communicate their thoughts and findings with their instructor and classmates. Additionally, self-check activities are built into each topic; quizzes are provided at the end of each lesson; and comprehensive tests are given at the end of each unit.

Overview

Unit 1 – Measurement and Geometry

- Lesson 1: Units of Measurement
- Lesson 2: Perimeter, Circumference, and Area
- Lesson 3: Surface Area and Volume
- Lesson 4: The Pythagorean Theorem
- Lesson 5: Geometric Proportions
- Lesson 6: Polygon Relationships
- Lesson 7: Mathematical Reasoning

Unit 2 – Algebra 1

- Lesson 1: Performing Operations
- Lesson 2: Solving Equations Analytically
- Lesson 3: Equations and Problem-Solving
- Lesson 4: Inequalities
- Lesson 5: Absolute Values
- Lesson 6: Graphing of Linear Equations
- Lesson 7: Solutions by Graphing
- Lesson 8: Solving Systems of Equations
- Lesson 9: Monomials
- Lesson 10: Combining Polynomials
- Lesson 11: Application of Algebraic Techniques
- Lesson 12: Mathematical Reasoning

Objectives

Students will develop the following skills:

- Convert units of length within the metric and English systems.
- Calculate the area of squares, rectangles, parallelograms, triangles, trapezoids, and circles.
- Find the surface area and volume of prisms and cylinders.
- Identify and compare faces, edges, and vertices in prisms, pyramids, cones, and cylinders.
- Use proportions to solve problems involving similar triangles.
- Understand and use the definition of congruent polygons.
- Determine whether two triangles are congruent using the congruence shortcuts.
- Identify the quadrants of and graph points on the coordinate plane.
- Solve problems involving scale drawings and maps.
- Graph linear equations by finding the x- and y-intercepts.
- Solve equations with variables on both sides of the equation.
- Solve and graph the solutions of inequalities by using the addition and subtraction properties of inequalities.
- Solve and graph the solutions to a system of two linear inequalities.
- Solve systems of two linear equations using multiplication and addition (the linear combination method).
- Solve equations that require using the Distributive Property to remove parentheses.
- Determine which operations are necessary to solve a word problem.
- Write and solve inequalities that model real-life situations using the multiplication and division properties of inequality.
- Simplify monomials using the Power of a Power Rule and the Power of a Product Rule.
- Use the Distributive Property to find the product of a monomial and a polynomial.
- Multiply two binomials, including special products.
- Solve distance, rate, and time problems using algebraic techniques.
- Solve percent mixture problems using systems of equations.
- Write and graph linear equations that represent real-world relationships.
- Use inductive reasoning to make conjectures
- Communicate mathematically by expressing ideas, analyzing situations, explaining procedures for correct computation, and describing results numerically and graphically.
- Use the Internet to gain useful information.
- Use discussion groups and email to communicate with teacher and classmates and develop a sense of class membership.

Activities and Assessments

- **Practice Sets and Vocabulary Reviews** – Each lesson has numerous practice sets, along with a review of math vocabulary.
- **6 Online Discussion Group Activities** – Throughout this course, students will participate in six group discussions of topics relevant to the material covered. The teacher evaluates the students' contributions to the discussions and provides grading and feedback.
- **2 Mathematical Reasoning Assignments** – At the end of each unit, students demonstrate their understanding of the content by completing a computer-graded mathematical reasoning assignment.
- **17 Quizzes, 2 Unit Evaluations, and 1 Final Exam** – Along with numerous self-check activities throughout the course, there is a quiz at the end of 17 of the 19 lessons in the course. There is also an evaluation at the end of each unit. At the conclusion of the course, students are given one opportunity to complete a comprehensive final exam. All of these assessments are computer-graded and provide students with immediate feedback on their work.