Reasoning in Mathematics is a two-semester course designed to prepare students for success in college, career, and life, with instruction that focuses on how mathematics and statistics inform decision-making. Students will apply quantitative reasoning to real-world situations, describing and analyzing statistical data and modeling data with functions. They will also apply matrices, truth tables, and algorithms to draw conclusions. In addition, students will analyze real-world financial scenarios involving credit card debt, loans, savings, and investments. Throughout the course, they will discover new concepts and deepen their conceptual understanding through guided instruction in an interactive, feedback-rich environment.

There are no required materials for this course.

Length: Two Semesters

Unit 1: Solving Geometric Problems

- Right Triangles
- Similar Right Triangles
- Performance Task: The Parallax Problem
- Law of Cosines and Proofs
- Law of Sines and Proofs
- Graphs of Trigonometric Functions
- Transformations of Sinusoids
- Wrap-Up: Solving Geometric Problems

Unit 2: Describing Data

- Numerical Data
- Measures of Center and Spread
- Project: Designing and Completing a Survey
- Describing Distributions
- Comparing Distributions
- Wrap-Up: Describing Data

Unit 3: Modeling Data

- Linear Models in Data
- Correlation
- Regression Methods
- Assessing Data Models
- Nonlinear Models
- Transforming Bivariate Data
- Wrap-Up: Modeling Data

Unit 4: Introduction to Statistics

- What Is Statistics?
- Collecting Data

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- Random Sampling
- Experimental Design
- Margin of Error and Confidence Intervals
- Evaluating Statistical Studies
- Wrap-Up: Introduction to Statistics

Unit 5: Probability

- Probability
- Permutations and Combinations
- Independent and Dependent Events
- Conditional Probability
- Wrap-Up: Introduction to Probability

Unit 6: Probability Applications

- Logic and Truth Tables
- Using Two-Way Frequency Tables
- Using Probability to Make Decisions
- Discrete Random Variables
- Binomial Probability
- Wrap-Up: Probability Applications

Unit 7: Semester Wrap-Up

- Semester Wrap-Up

Unit 8: Matrices

- Matrix Addition and Scalar Multiplication
- Matrix Multiplication
- Transformations and Matrices
- Applications of Matrices
- Matrices Wrap-Up

Unit 9: Algorithms in the Real World

- Selection and Ranking Algorithms
- Graph Theory
- Project
- Algorithms in the Real World Wrap-Up

Unit 10: Earning and Spending

- Wages
- Compensation Packages
- Linear Equations and Wages
- Percentages and Commission
- Sales Tax
- Coupons, Rebates, and Sales
- Earning and Spending Wrap-Up

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Unit 11: Saving and Borrowing Money

- Growth Models
- Compound Interest
- Credit Cards
- Tracking Payments and Purchases
- Comparing Credit Cards
- Saving and Borrowing Money Wrap-up

Unit 12: Loans

- Single Payment Loans and Payday Loans
- Installment Loans and Layaway
- Monthly Payment
- Loan Pre-Approvals
- Deferred Payments
- Paying Off
- Prepayment
- Loans Wrap-Up

Unit 13: Investments

- CDs
- Annuities
- Bonds
- Stocks
- The Stock Market
- Prediction
- Investments Wrap-Up

Unit 14: Semester Wrap-Up

- Semester Wrap-Up

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