Course Description:

In Applied Mathematics (1 of 1), students will build on the knowledge from previous math courses, including Algebra I, as they investigate how scientists, engineers, architects, and artists use math to solve problems and create things. They will gain insights about the world around them through geometry, physics, probability, statistics, and other mathematical concepts.

Course Objectives:

- Analyze real-life situations.
- Describe relationships in real-life situations.
- Make predictions about real-life situations.
- Model relationships in real-life situations.

Required Materials:

In course.

Course Overview:

Unit 1: Functions in Science and Engineering
- Instructional Texts (Lessons 1–5)
    - Text and Videos
        - Hooke's Law
        - Newton's Second Law of Motion
        - Boyle's Law
        - Exponential Growth & Decay in Science
        - Modeling Motion with Quadratic Functions
    - Explore Further (Lesson 4)
    - Practice Problem(s)
    - Workbook
- Discussion
- Checkpoint (Lessons 2, 4)
- Unit 1 Exam (Lesson 5)

Unit 2: Geometry in Engineering, Architecture, and Fine Arts Part 1
- Instructional Texts (Lessons 6–10)
    - Text and Videos
        - Similarity and Symmetry in Architecture and Engineering
        - Geometric Transformations in Architecture, Art, and Photography
        - Scale Drawings in Engineering and Architecture
        - Perspectives in Two-Dimensional Art and Photography
        - Mathematical Patterns in Music
    - Explore Further (Lessons 7, 8, 9)
    - Practice Problem(s)
    - Workbook
- Project (Lessons 8, 9)
- Discussion (Lessons 6, 7)
- Checkpoint (Lesson 7)

- Unit 2 Exam (Lesson 10)

Unit 3: Geometry in Engineering, Architecture and Fine Arts Part 2
- Instructional Texts (Lessons 11–15)
  - Text and Videos
    - Surface Area in Architecture and Art
    - Volume in Engineering, Architecture, and Art
    - Pythagorean Theorem and Special Right Triangles
    - Trigonometric Ratios in Engineering, Science, and Architecture
    - Periodic Functions in Music and Art
  - Explore Further (Lessons 12, 13, 14 Note: In Lesson 12, there is an activity where the only content is in Explore Further boxes and the questions pertain to this content.)
  - Practice Problem(s)
  - Workbook
- Project (Lessons 12, 13)
- Discussion (Lessons 11, 14, 15)
- Checkpoint (Lessons 12, 14)
- Unit 3 Exam (Lesson 15)

Unit 4: Probability in the Social Sciences
- Instructional Texts (Lessons 16–20)
  - Text and Videos
    - Combinations in Social Science Experiments and Studies
    - Permutations in Social Science Experiments and Studies
    - Theoretical and Empirical Probability in the Social Sciences
    - Binomial Models for Probability in the Social Sciences
    - Geometric Models for Experimental Studies in the Social Sciences
  - Explore Further (Lessons 16, 17)
  - Practice Problem(s)
  - Workbook
- Project (Lessons 18, 19)
- Discussion (Lessons 16, 17, 19, 20)
- Checkpoint (Lessons 17, 19)
- Unit 4 Exam (Lesson 20)

Unit 5: Using Statistics in the Social Sciences
- Instructional Texts (Lessons 21–25)
  - Text and Videos
    - Planning and Conducting a Survey Study
    - Statistical Graphs in the Social Sciences – Part 1
    - Statistical Graphs in the Social Sciences – Part 2
    - Measures of Central Tendency & Variability
    - Analyzing and Presenting the Results of a Survey Study
  - Explore Further (Lessons 24, 25)
  - Practice Problem(s)
  - Workbook
- Projects (Lessons 21–25)
- Discussion (Lessons 22, 24)
- Checkpoint (Lessons 21–24)

- Unit 5 Exam (Lesson 25)

Unit 6: Studies in Social Science
- Instructional Texts (Lessons 26–29)
    - Text and Videos
        - Population Mean and Proportion in Studies from the Social Sciences
        - Evaluating Experimental and Observational Studies from the Social Sciences
        - Using Data to Evaluate Media Reports and Marketing Claims
        - Regression Models in the Social Sciences
    - Explore Further (Lessons 28, 29)
    - Practice Problem(s)
    - Workbook
- Checkpoint (Lessons 27, 29)
- Discussion (Lessons 26–29)
- Reviews (Lesson 30)
- Course Final Exam (Lesson 30)