

Algebraic Reasoning Year at a Glance

COURSE DESCRIPTION:

In Algebraic Reasoning, students will extend their understanding of algebra by exploring patterns, relationships, and functions through multiple representations—verbal, numerical, graphical, and symbolic. The course builds on the foundations of Algebra I and Geometry, emphasizing reasoning, problem solving, and the use of mathematics to model real-world situations.

Students will develop a deeper conceptual understanding of algebraic structures, including sequences, systems, and function families (linear, quadratic, exponential, and more). Through inquiry and analysis, students will use data to recognize trends, make predictions, and justify conclusions. Technology and modeling will be integral tools in exploring and verifying mathematical relationships.

This course strengthens critical thinking skills and prepares students for college-level mathematics and courses such as Precalculus, Statistics, or College Algebra.

(Based on the Texas Essential Knowledge and Skills for Algebraic Reasoning — TEA Chapter 111, Subchapter C, §111.46)

[Texas TEKS Reference](#)

COURSE OBJECTIVES:

Texas Algebraic Reasoning TEKS objectives focus on enabling students to:

- Analyze and describe patterns and relationships using multiple representations.
- Create, transform, and solve equations and inequalities involving real-world contexts.
- Explore function families and transformations (linear, quadratic, exponential, rational, and radical).
- Use data analysis and regression techniques to model relationships.
- Apply algebraic reasoning to systems of equations and inequalities.
- Justify solutions and communicate reasoning using precise mathematical language.
- Use technology and graphing tools to explore and verify mathematical models.
- Connect algebraic concepts to financial, geometric, and scientific applications.

COURSE OUTLINE:

Semester 1

Semester 2

Patterns, Relations, and Algebraic Thinking

Modeling with Data

Equations and Inequalities in Context

Quadratic and Polynomial Relationships

Function Concepts and Transformations

Exponential and Logarithmic Models

Linear and Absolute Value Functions

Systems of Equations and Inequalities

Sequences and Series

Rational and Radical Relationships

Rate of Change and Slope

Real-World Problem Solving Projects

Data Analysis and Scatter Plots

Technology and Mathematical Modeling

Justification, Proof, and Communication

Cumulative Review and Applications