



**Course Name: Algebraic Reasoning**  
**School Year: 2021-2022**

### **Course Purpose and Relevance:**

In **Algebraic Reasoning**, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I, continue with the development of mathematical reasoning related to algebraic understandings and processes, and deepen a foundation for studies in subsequent mathematics courses. Students will broaden their knowledge of functions and relationships, including linear, quadratic, square root, rational, cubic, cube root, exponential, absolute value, and logarithmic functions. Students will study these functions through analysis and application that includes explorations of patterns and structure, number and algebraic methods, and modeling from data using tools that build to workforce and college readiness such as probes, measurement tools, and software tools, including spreadsheets.

The **process standards** weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

### **Overview of Student Outcomes:**

- The student connects finite differences or common ratios to attributes of functions.
- The student understands the connections among representations of functions and combinations of functions, including the constant function,  $f(x) = x$ ,  $f(x) = x^2$ ,  $f(x) = \sqrt{x}$ ,  $f(x) = 1/x$ ,  $f(x) = x^3$ ,  $f(x) = \sqrt[3]{x}$ ,  $f(x) = b^x$ ,  $f(x) = |x|$ , and  $f(x) = \log_b(x)$  where  $b$  is 10 or  $e$ ; functions and their inverses; and key attributes of these functions.
- The student simplifies and performs operations on functions represented in a variety of ways, including real-world situations.
- The student represents, simplifies, and performs operations on matrices and to solve systems of equations using matrices.
- The student estimates and determines solutions to equations resulting from functions and real-world applications with fluency.
- The student analyzes and models data based on real-world situations with corresponding functions.

### **Available Support for Student Learning:**

Refer to the teacher's Course Syllabus for resources and course specific opportunities. The adopted textbook for Algebraic Reasoning is Cosenza & Associates Algebraic Reasoning. Student digital textbook is available through the CCISD Student Portal.

### **Links to Course TEKS on TEA website:**

[Texas Knowledge and Skills for Algebraic Reasoning](#)



## **First Grading Period**

**Unit 1: Linear Functions**

**Unit 2: Quadratic Functions**

**Unit 3: Exponential Functions**

---

## **Second Grading Period**

**Unit 4: Other Non-Linear Functions**

**Unit 5: Inverse of Functions**

**Unit 6: Comparing and Contrasting Functions**

**Semester Review and District Exam**

---

## **Third Grading Period**

**Unit 7: Function Operations**

**Unit 8: Operations and Compositions of Functions**

**Unit 9: Decomposition Polynomial Functions**

---

## **Fourth Grading Period**

**Unit 10: Solutions of Equations**

**Unit 11: Matrices**