

# Course Syllabus

## Mathematics, Algebra II

Jefferson County Schools Curriculum, Final  
Jefferson County Schools

The Terra Nova Complete Battery for Mathematics is "designed to help students show what they know and can do. Many questions call for critical thinking, reasoning, and problem solving. Questions allow students to use different strategies and to take individual paths to a solution. Real-world topics engage students' interest, and the extensive use of graphics reduces the need for explanatory text and provides a supportive context. Themes group items into meaningful configurations, and items are generally sequenced to promote initial success so that students will continue with confidence to more challenging questions.

The [Terra Nova] tests taps broad mathematical power, yet retains the specifics from the traditional curriculum. The first section of the test includes computation, computation in context, and estimation items, and is administered without calculators. The second section covers a broad range of core skills and may be administered with calculators. Some questions require the use of rulers, which are supplied with the testing materials."

The Tennessee Mathematics Curriculum Standards provide standards, performance indicators, and accomplishments for students in mathematics.

The Tennessee Mathematics Framework for grades 9 through 12 outlines skills to be taught in Algebra II.

### Algebraic Concepts

- The learner will be able to perform operations on expressions and give justification of the procedures selected.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to informally explain and illustrate the concept of inverse.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to obtain solutions to linear systems employing a variety of methods including matrices.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

- The learner will be able to connect concrete, graphical, oral, and symbolic illustrations of absolute value.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to describe the inverse operations of addition/subtraction and multiplication/division.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to use inverse operations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to use the concept of inverse.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to model inverse operations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to interpret the outcomes of algebraic procedures.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to describe the definition of a variable in an expression, equation, and inequality.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to apply the idea of a variable in obtaining solutions to inequalities.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to use the concept of variable to simplify expressions and obtain solutions to equations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

### Calculus and Pre-Calculus

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- The learner will be able to apply matrices in real world problem solving.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29

### Data Interpretation

- The learner will be able to draw and/or interpret graphs which model real world phenomena.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to gather data using appropriate technology.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

### Functions

- The learner will be able to explain the domain and range of functions and describe restrictions imposed by either the operations or by the real world scenario which the functions illustrate.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to illustrate understanding of the behavior of quadratic, exponential, periodic, and logarithmic functions and their graphs.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to study graphs to explain the behavior of functions.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to represent many different functions.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to solve real world problems using linear programming.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

- The learner will be able to recognize functions.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to recognize the attributes of families of functions.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to explain the attributes of families of functions.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to describe the results of changing parameters of a parent function.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

### Geometry

- The learner will be able to use geometric relationships, properties, and formulas to obtain solutions to real world problems.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31
- The learner will be able to apply techniques of inductive reasoning to formulate a conjecture.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31
- The learner will be able to use deductive reasoning to justify conclusions.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31
- The learner will be able to describe position using spatial sense with two-dimensional coordinate systems.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31
- The learner will be able to describe position using spatial sense with three-dimensional coordinate systems.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31

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### Measurement

- The learner will be able to use measurement ideas and relationships in algebraic problem solving scenarios.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to use measurement ideas and relationships in geometric problem solving situations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to use the concept of rate of change.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

### Number Theory

- The learner will be able to illustrate comprehension of the subsets, elements, properties, and/or operations of the complex number system.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29
- The learner will be able to apply mathematical notations appropriately.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29

### Numeration

- The learner will be able to study mathematical patterns associated with algebra and geometry in real world problem solving situations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to apply algebraic thought processes to generalize a pattern by expressing the pattern in function notation.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to apply estimation strategies to forecast computational results.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29

### Probability/Statistics

- The learner will be able to gather, illustrate and explain linear and nonlinear data sets formulated from the real world.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to study the validity of statistical conclusions and the use and misuse of data.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31
- The learner will be able to explain and use the normal distribution and its properties.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to select, create, and study suitable graphical illustrations for a set of data including pie charts, histograms, stem and leaf plots, scatterplots and/or box and whisker plots.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 31
- The learner will be able to use the Law of Large Numbers.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to make predictions from data using curve fitting applying appropriate technology.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to create inferences about a set of information using suitable measures of central tendency and dispersion (including variance and standard deviation).  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30
- The learner will be able to analyze the likelihood of an event using theoretical and experimental probability.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

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■ The learner will be able to apply the idea of randomness in sampling.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

■ The learner will be able to identify events as mutually exclusive and non-mutually exclusive.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

■ The learner will be able to study the probability of dependent and of independent events.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

■ The learner will be able to use appropriate technology to apply counting principles of permutations and combinations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

■ The learner will be able to analyze data using appropriate technology.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

■ The learner will be able to approximate probability using simulations.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 30

### Problem Solving

● The learner will be able to explore problems individually or in cooperative groups.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29

■ The learner will be able to evaluate the reasonableness of a given solution.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29, p. 29

### Real Numbers and the Coordinate Plane

● The learner will be able to choose and use an appropriate strategy for computing with real numbers.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29

■ The learner will be able to connect concrete, graphical, verbal, and symbolic illustrations of real numbers.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29

### Technology

■ The learner will be able to appropriately use technology to solve problems.  
Source: TN: Curriculum Framework (9-12), January 30, 1998, Algebra II, p. 29