Course Syllabus
Mathematics, Grade 5

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 Terra Nova Complete Battery assesses students in fifth grade (Level 15).

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Algebraic Concepts

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- The learner will be able to (ESSENTIAL) comprehend rules for algebra.
- The learner will be able to (IMPORTANT) analyze change in many different contexts.
- The learner will be able to (ESSENTIAL) communicate mathematical relationships by applying equations.
- The learner will be able to (IMPORTANT) comprehend that an equation is a number sentence which expresses that two quantities are equal.
- The learner will be able to (ESSENTIAL) understand the concept of an expression.
- The learner will be able to (ESSENTIAL) apply basic function rules.
- The learner will be able to (ESSENTIAL) comprehend rules for functions.
- The learner will be able to (IMPORTANT) represent and analyze mathematical situations and structures using algebraic methods.
- The learner will be able to (ESSENTIAL) make connections between open sentences and every day situations.
- The learner will be able to (ESSENTIAL) obtain solutions to open sentences using the four operations.
- The learner will be able to (IMPORTANT) obtain solutions to open sentences through the application of informal methods and knowledge of operations.
- The learner will be able to (ESSENTIAL) generalize numerical patterns using a variable.
- The learner will be able to (ESSENTIAL) comprehend the concepts of operation sense.
- The learner will be able to (ESSENTIAL) demonstrate an understanding of the properties of various operations.

- The learner will be able to (IMPORTANT) analyze patterns.
- The learner will be able to (ESSENTIAL) extend number patterns (Learning Accomplishment includes "generalize").
- The learner will be able to (ESSENTIAL) extend geometric patterns.
- The learner will be able to (IMPORTANT) apply the commutative, associative, zero, distributive, and commutative properties property.
- The learner will be able to (IMPORTANT) demonstrate that division is not commutative.
- The learner will be able to (IMPORTANT) illustrate the properties of operations.
- The learner will be able to (ESSENTIAL) extend rate charts to solve real-world problems.
- The learner will be able to (ESSENTIAL) calculate simple rates.
- The learner will be able to (IMPORTANT) compare and explain scenarios that involve constant and/or varying rates of change by applying various strategies.
- The learner will be able to (IMPORTANT) represent and analyze patterns, relations, and functions using words, tables, and graphs.
- The learner will be able to (IMPORTANT) illustrate the concept of a variable as an unknown quantity using a letter or a symbol.
- The learner will be able to (IMPORTANT) explore how a change in one variable relates to a change in another variable.
- The learner will be able to determine the value(s) of a variable in the denominator for which an expression containing absolute values is undefined.

Data Analysis and Probability

- The learner will be able to (ESSENTIAL) make interpretations of data displays.
- The learner will be able to (ESSENTIAL) illustrate data using bar graphs and pictographs.
- The learner will be able to (ESSENTIAL) interpret information given in bar graphs and pictographs.
- The learner will be able to (ESSENTIAL) read bar graphs.
- The learner will be able to (ESSENTIAL) read circle graphs.
- The learner will be able to (ESSENTIAL) make comparisons of data.
- The learner will be able to (ESSENTIAL) evaluate conclusions that are based on data.
- The learner will be able to (ESSENTIAL) make predictions that are based on data.
- The learner will be able to (IMPORTANT) create questions and gather, organize, and illustrate data to answer those questions.
- The learner will be able to (IMPORTANT) study many different illustrations of data and evaluate how accurately the data is depicted.
- The learner will be able to (IMPORTANT) comprehend how data collection techniques affect the nature of the data set.
- The learner will be able to (IMPORTANT) use observations, surveys, and experiments to gather data.
- The learner will be able to (ESSENTIAL) read a diagram.
- The learner will be able to (IMPORTANT) explain the likelihood of an event by applying certain, impossible, more likely, less likely, and equally likely.
- The learner will be able to (IMPORTANT) apply the measures of central tendency.

- The learner will be able to (ESSENTIAL) calculate the mean, median, and mode of a set of data.
- The learner will be able to (IMPORTANT) connect mean, median, and mode to a visual illustration of a set of data.
- The learner will be able to (IMPORTANT) determine all possible outcomes in basic probability activities.
- The learner will be able to (ESSENTIAL) identify the probability of a given situation.
- The learner will be able to (IMPORTANT) comprehend and apply the basic concepts of probability.
- The learner will be able to (ESSENTIAL) determine the most likely, least likely, or equally likely outcomes in simple experiments.
- The learner will be able to (ESSENTIAL) represent the likelihood of an event using a fractional number from zero to one.
- The learner will be able to (IMPORTANT) develop and evaluate predictions according to sample data.
- The learner will be able to (IMPORTANT) design investigations to address a question.
- The learner will be able to (ESSENTIAL) calculate the range of a set of data.
- The learner will be able to (IMPORTANT) describe the importance of sample size in investigations.
- The learner will be able to (IMPORTANT) select and use suitable statistical methods to analyze data.
- The learner will be able to (ESSENTIAL) read information in a table and/or chart.
- The learner will be able to (IMPORTANT) illustrate and interpret data using tables, circle graphs, and line graphs.

Geometry

The Geometry Unit includes Competencies/Objectives which focus on exploring geometric concepts from multiple perspectives. Students study properties and construction of figures, proofs and theorems, history of geometry, transformations, logic, and problem solving.

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- The learner will be able to (ESSENTIAL) comprehend the concept of an angle.
- The learner will be able to (ESSENTIAL) compare characteristics of two- and three-dimensional figures.
- The learner will be able to (IMPORTANT) identify and describe the attributes of a circle using appropriate mathematical language (e.g., radius, diameter, center).
- The learner will be able to (IMPORTANT) describe a motion or a series of motions that will show that two shapes are congruent.
- The learner will be able to (IMPORTANT) construct a model of a three-dimensional geometric shape from a two-dimensional pattern.
- The learner will be able to (ESSENTIAL) apply an understanding of the coordinate system.
- The learner will be able to (ESSENTIAL) compare and contrast congruent and symmetrical figures.
- The learner will be able to (ESSENTIAL) recognize the solid figure created from a two-dimensional illustration (net) of that figure by applying spatial reasoning (i.e.cube, rectangular prism, pyramid, cone, or cylinder).
- The learner will be able to (ESSENTIAL) classify geometric figures though the use of critical attributes.
- The learner will be able to (IMPORTANT) draw points, lines,line segments, rays, and angles.
- The learner will be able to (IMPORTANT) describe characteristics of lines and angles (e.g., Parallel, perpendicular, intersecting. right, acute, obtuse).

- The learner will be able to (ESSENTIAL) identify lines, line segments, rays, and angles.
- The learner will be able to (ESSENTIAL) locate and specify a point in Quadrant 1 of a coordinate system.
- The learner will be able to (IMPORTANT) formulate and test hypotheses about geometric properties.
- The learner will be able to (IMPORTANT) create and describe mental images of objects, patterns, and paths.
- The learner will be able to (IMPORTANT) use mathematical language to explain location and movement.
- The learner will be able to (IMPORTANT) use visualization, spatial reasoning, and geometric modeling to solve problems.
- The learner will be able to (IMPORTANT) obtain solutions to real world problems by applying visualization and spatial reasoning.
- The learner will be able to (ESSENTIAL) identify figures that are similar and/or congruent.
- The learner will be able to (IMPORTANT) investigate similarity.
- The learner will be able to (IMPORTANT) construct and draw two-and three-dimensional geometric figures.
- The learner will be able to (IMPORTANT) specify locations and describe spatial relationships using coordinate geometry and other representational systems.
- The learner will be able to (IMPORTANT) explain the results of subdividing and combining shapes.
- The learner will be able to (IMPORTANT) apply transformations and use symmetry to study mathematical scenarios.
- The learner will be able to (IMPORTANT) explain line and rotational symmetry in plane figures.
- The learner will be able to (ESSENTIAL) recognize line symmetry present in two-dimensional figures.
- The learner will be able to (ESSENTIAL) recognize symmetry.
- The learner will be able to (IMPORTANT) identify, compare, and analyze attributes of two-and three-dimensional figures.
- The learner will be able to (IMPORTANT) explain the motion or series of motions that are necessary to match two congruent shapes.
- The learner will be able to (IMPORTANT) apply transformations to study mathematical situations.
- The learner will be able to (IMPORTANT) explain and investigate transformations (flips, slides, and turns) of two-dimensional figures.
- The learner will be able to (ESSENTIAL) use spatial reasoning to predict the result of sliding, flipping, or turning a two-dimensional shape.

Measurement

The Measurement Unit includes Competencies/Objectives which focus on measurement concepts, applications, and analysis. Students study length, area, circumference, perimeter, volume, weight, formulas, distance, calendar, money, tools, accuracy, units, constructions, patterns, and problem solving.

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- The learner will be able to (IMPORTANT) show an understanding of the approximate nature of measurement.
- The learner will be able to (ESSENTIAL) solve real world application problems requiring area and perimeter of rectangles.

- The learner will be able to (ESSENTIAL) calculate the area of a given figure.
- The learner will be able to (ESSENTIAL) use the appropriate formula to calculate the area of parallelograms and triangles (Learning Accomplishment includes "develop and understand").
- The learner will be able to (ESSENTIAL) perform measurement conversions from one unit to another.
- The learner will be able to (IMPORTANT) describe and apply suitable estimation strategies utilizing standard measurement units.
- The learner will be able to (IMPORTANT) investigate the effects to the measurements of a two-dimensional figure when the figure is changed in some way (e.g., perimeter, area).
- The learner will be able to (IMPORTANT) choose and apply suitable instruments for measuring in real world scenarios.
- The learner will be able to (ESSENTIAL) find the measure of length to the nearest centimeter and quarter-inch.
- The learner will be able to (IMPORTANT) comprehend the concepts of length, perimeter, circumference, area, weight, capacity, volume, elapsed time, and angle measure.
- The learner will be able to (ESSENTIAL) apply estimation to check reasonableness of measurements in length or volume.
- The learner will be able to (IMPORTANT) comprehend the measurable characteristics of objects and the units, systems, and processes of measurement.
- The learner will be able to (IMPORTANT) apply appropriate techniques, tools, and formulas to determine measurements.
- The learner will be able to (ESSENTIAL) perform calculations with money.
- The learner will be able to (ESSENTIAL) apply strategies to approximate perimeter and area of rectangles.
- The learner will be able to (ESSENTIAL) determine the perimeter of a geometric figure.
- The learner will be able to (ESSENTIAL) solve real-world problems involving addition and addition of measurements.
- The learner will be able to (IMPORTANT) describe how scale in maps shows relative size and distance.
- The learner will be able to (IMPORTANT) generate informal procedures to find the surface area and volume of a rectangular solid.
- The learner will be able to (ESSENTIAL) apply Fahrenheit and Celsius scales to read temperatures.
- The learner will be able to (ESSENTIAL) understand temperature concepts in problem solving situations.
- The learner will be able to (ESSENTIAL) obtain solutions to real world problems that involve elapsed time.
- The learner will be able to (ESSENTIAL) solve problems involving time.
- The learner will be able to (ESSENTIAL) use a ruler.
- The learner will be able to (ESSENTIAL) identify a suitable unit of measure for use in a particular situation.
- The learner will be able to (ESSENTIAL) choose suitable standard units to measure length, perimeter, area, capacity, volume, weight, time, temperature, and angles.
- The learner will be able to (IMPORTANT) choose and use suitable standard units to measure length, perimeter, area, capacity, volume, weight, time, temperature, and angles.
- The learner will be able to (IMPORTANT) comprehend how differences in units affect the accuracy of measurement.

- The learner will be able to (ESSENTIAL) make connections for basic units within the same measurement system.

Number and Operations

- The learner will be able to (IMPORTANT) apply models, benchmarks, and equivalent forms to add and subtract common fractions with like and unlike denominators.
- The learner will be able to (ESSENTIAL) add and subtract commonly used fractions.
- The learner will be able to (ESSENTIAL) add, subtract, and multiply decimal amounts.
- The learner will be able to (IMPORTANT) relate the effects of the four basic operations on size and order of numbers.
- The learner will be able to (ESSENTIAL) compare and order numbers.
- The learner will be able to (IMPORTANT) select appropriate methods and tools for computations (e.g., mental computation, estimation, calculators, paper and pencil).
- The learner will be able to (ESSENTIAL) correctly perform various computations.
- The learner will be able to (ESSENTIAL) perform computations in the context of given problems.
- The learner will be able to (ESSENTIAL) determine the reasonableness of computations and numerical estimations.
- The learner will be able to (ESSENTIAL) make connections between symbolic illustrations of proper and improper fractions and models of those fractions.
- The learner will be able to (ESSENTIAL) represent, compare, and order whole numbers and decimals to thousandths.
- The learner will be able to (IMPORTANT) divide decimals.
- The learner will be able to (ESSENTIAL) determine divisibility.
- The learner will be able to (ESSENTIAL) use estimation in solving problems.
- The learner will be able to (ESSENTIAL) apply estimation to choose a reasonable solution.
- The learner will be able to (ESSENTIAL) make estimations with money.
- The learner will be able to (ESSENTIAL) solve problems, compute fluently, and make reasonable estimates.
- The learner will be able to (ESSENTIAL) comprehend the concepts of equivalent forms.
- The learner will be able to (ESSENTIAL) identify and formulate equivalent forms of common fractions, decimals, and percents (e.g., 1/10, 1/4, 1/2, 3/4).
- The learner will be able to (ESSENTIAL) conceptually understand expanded notation.
- The learner will be able to (ESSENTIAL) find factors.
- The learner will be able to (ESSENTIAL) compare and order fractions using the appropriate symbol (>, <, =).
- The learner will be able to (IMPORTANT) illustrate the relationship between proper, improper fractions and mixed numbers.
- The learner will be able to (ESSENTIAL) multiply a fraction by a multiple of its denominator (denominator less than or equal to 10).
- The learner will be able to (IMPORTANT) explain and show the inverse relationship that exists between addition and subtraction.
- The learner will be able to (IMPORTANT) describe and show the inverse relationship of multiplication and division.
- The learner will be able to (ESSENTIAL) identify when information is extraneous or missing.

- The learner will be able to (ESSENTIAL) find multiples.
- The learner will be able to (IMPORTANT) apply a variety of models to illustrate relationships among whole numbers, fractions, mixed numbers, and decimals (e.g.,number lines, base ten blocks, Venn diagrams, hundreds boards).
- The learner will be able to (IMPORTANT) identify the relationships between common decimals and fractions.
- The learner will be able to (ESSENTIAL) represent numbers as both improper fractions and mixed numbers.
- The learner will be able to (ESSENTIAL) apply number lines.
- The learner will be able to (IMPORTANT) understand numbers, ways of representing numbers, relationships among numbers, and number systems.
- The learner will be able to (IMPORTANT) describe why one form of a number could be more useful than another form for calculations.
- The learner will be able to (ESSENTIAL) identify numbers.
- The learner will be able to (IMPORTANT) understand the meaning of operations and how they relate to one another.
- The learner will be able to (ESSENTIAL) find an element that is missing in a pattern.
- The learner will be able to (ESSENTIAL) understand and/or apply geometric patterns.
- The learner will be able to (ESSENTIAL) understand rules for patterns.
- The learner will be able to (ESSENTIAL) relate the place value of a particular digit from millions to thousandths.
- The learner will be able to (ESSENTIAL) understand the concept of place value.
- The learner will be able to (ESSENTIAL) obtain solutions to multiple-step real world problems that involve addition, subtraction, or multiplication of whole numbers or decimals.
- The learner will be able to (IMPORTANT) obtain solutions to real world problems that use decimals, fractions, or percents.
- The learner will be able to (IMPORTANT) use commutative, associative, and identity properties.
- The learner will be able to (ESSENTIAL) use proportional reasoning to solve story problems.
- The learner will be able to (ESSENTIAL) comprehend the concepts of ratio and/or proportion.
- The learner will be able to (ESSENTIAL) read numbers.
- The learner will be able to (ESSENTIAL) read and write numbers from the thousandths to the millions.
- The learner will be able to (ESSENTIAL) round numbers to the desired degree of accuracy.
- The learner will be able to (ESSENTIAL) evaluate the reasonableness of a given solution.
- The learner will be able to (IMPORTANT) use mathematical vocabulary and appropriate symbols to communicate ideas.
- The learner will be able to (ESSENTIAL) add, subtract, multiply, and divide whole numbers (multipliers and divisors no more than two digits).
- The learner will be able to (ESSENTIAL) represent whole numbers and two-place decimals in expanded form.