

# Course Syllabus

## Mathematics, Grade 2

Jefferson County Schools Curriculum, Final  
Jefferson County Schools

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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 second grade (Level 12).

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### Algebraic Concepts

The Algebraic Concepts Unit includes Competencies/Objectives which focus on algebraic equations and operations. Students explore the symbolic nature of algebraic concepts by identifying and extending patterns in algebra, by following algebraic procedures, and by proving theorems with properties.

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by proving theorems with properties.

- The learner will be able to (IMPORTANT) explain qualitative change.
- The learner will be able to (IMPORTANT) explain quantitative change.
- The learner will be able to (IMPORTANT) analyze change in many different contexts.
- The learner will be able to (IMPORTANT) sort and classify objects according to size, number, and other properties.
- The learner will be able to (IMPORTANT) determine the output for a given input when given the one operation function rule involving addition and subtraction.
- The learner will be able to (IMPORTANT) comprehend the vocabulary and symbols of mathematics using physical, pictorial, and oral representations.
- The learner will be able to (IMPORTANT) illustrate addition and subtraction sentences written symbolically involving numbers from zero through twenty using manipulatives.
- The learner will be able to (IMPORTANT) interpret and obtain solutions to open sentences involving addition and subtraction.
- 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 (IMPORTANT) continue a growing pattern.
- The learner will be able to (IMPORTANT) recognize the unit of a three-part repeating pattern.
- The learner will be able to (IMPORTANT) translate a repeating pattern from one form to another (e.g., red-blue to snap-clap-clap).

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- The learner will be able to (IMPORTANT) apply the commutative property of addition.
- The learner will be able to (IMPORTANT) apply the property of zero in addition and subtraction.
- The learner will be able to (IMPORTANT) demonstrate that subtraction is not commutative.
- The learner will be able to (IMPORTANT) illustrate the properties of operations.
- The learner will be able to (IMPORTANT) represent and analyze functions in various ways.
- The learner will be able to (IMPORTANT) sort objects by at least two characteristics.
- The learner will be able to (IMPORTANT) recognize the rules used to sort objects or numbers.
- The learner will be able to (IMPORTANT) use mathematical vocabulary and appropriate symbols to communicate ideas.

### Data Analysis and Probability

- The learner will be able to (ESSENTIAL) read bar graphs.
- The learner will be able to (ESSENTIAL) make interpretations of data displays.
- The learner will be able to (IMPORTANT) ask questions that can be answered by gathering data.
- The learner will be able to (IMPORTANT) develop, choose, and apply appropriate strategies to collect, organize, display, and analyze data.
- The learner will be able to (IMPORTANT) read and interpret tables, bar graphs, and pictographs.
- The learner will be able to (IMPORTANT) explain whether an event is likely or unlikely.
- The learner will be able to (IMPORTANT) create pictographs and bar graphs to display data.

- The learner will be able to (IMPORTANT) make predictions of the outcomes of events based on collected and displayed data.
- The learner will be able to (IMPORTANT) apply the basic concepts of probability.
- The learner will be able to (ESSENTIAL) obtain solutions to problems by applying data.
- The learner will be able to (IMPORTANT) read, interpret, and create tables using tally marks.

### 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 (IMPORTANT) recognize, name, build, draw and compare two- and three-dimensional figures.
- The learner will be able to (IMPORTANT) study the attributes of geometric figures.
- The learner will be able to (IMPORTANT) predict and explain the results of combining and taking apart two- and three-dimensional shapes.
- The learner will be able to (IMPORTANT) identify whole numbers on a number line.
- The learner will be able to (IMPORTANT) specify locations and explain spatial relationships.
- The learner will be able to (IMPORTANT) describe attributes and parts of three-dimensional solids.

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- The learner will be able to (IMPORTANT) identify figures which are symmetrical about a given line.
- The learner will be able to (IMPORTANT) recognize and apply the transformations translation, rotation, or reflection.
- The learner will be able to (IMPORTANT) illustrate a translation using physical or pictorial models (flips, slides, turns).
- The learner will be able to (ESSENTIAL) use the concepts, properties, and relationships of three-dimensional solids.
- The learner will be able to (ESSENTIAL) use the concepts, properties, and relationships of two-dimensional shapes.
- The learner will be able to (ESSENTIAL) apply the properties and concepts of transformations.
- The learner will be able to (ESSENTIAL) subdivide figures.
- The learner will be able to (ESSENTIAL) combine geometric figures in creating other geometric figures.
- The learner will be able to (ESSENTIAL) apply inductive and deductive reasoning to solve problems.
- The learner will be able to (ESSENTIAL) develop an understanding of calendars and their uses.
- The learner will be able to (IMPORTANT) relate days, dates, weeks, and months to a calendar.
- The learner will be able to (IMPORTANT) compare and order objects by weight, length, or capacity.
- The learner will be able to (IMPORTANT) describe the relationship between inches and feet.
- The learner will be able to (IMPORTANT) measure the length of an object to the nearest centimeter, half-inch, inch, and foot.
- The learner will be able to (IMPORTANT) find the attributes of an object in the environment that can be measured.
- The learner will be able to (IMPORTANT) use various methods and tools to determine measurements.
- The learner will be able to (IMPORTANT) measure area and perimeter using nonstandard units.
- The learner will be able to (IMPORTANT) understand the idea of perimeter and area.
- The learner will be able to (IMPORTANT) estimate time and length using various strategies.
- The learner will be able to (IMPORTANT) read and write time to the nearest hour, half-hour, and quarter-hour.
- The learner will be able to (IMPORTANT) obtain solutions to problems involving elapsed time in hour intervals.
- The learner will be able to (IMPORTANT) read a Fahrenheit and Celsius thermometers.
- The learner will be able to (IMPORTANT) use nonstandard units to measure and estimate weight and capacity.
- The learner will be able to (IMPORTANT) illustrate an understanding of measure and measurable attributes of objects.

### 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 (ESSENTIAL) perform calculations with money.
- The learner will be able to (ESSENTIAL) identify and understand how money is used.
- The learner will be able to (ESSENTIAL) make measurement estimations.
- The learner will be able to (ESSENTIAL) solve problems involving time.
- The learner will be able to (ESSENTIAL) use a ruler.

### Number and Operations

- The learner will be able to (IMPORTANT) add and subtract one-digit numbers with proficiency.
- The learner will be able to (IMPORTANT) add and subtract two-digit whole numbers using many different strategies and representations.
- The learner will be able to (IMPORTANT) apply calculators in problem solving scenarios.
- The learner will be able to (IMPORTANT) make comparisons of the unit fractions  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$ .
- The learner will be able to (IMPORTANT) determine whether a fraction is less than, more than, or equal to a half using physical models or pictures.
- The learner will be able to (ESSENTIAL) compare and order numbers.
- The learner will be able to (IMPORTANT) use symbols (i.e.,  $<$ ,  $>$ ,  $=$ ) to make comparisons of numbers.
- The learner will be able to (ESSENTIAL) correctly perform various computations.
- The learner will be able to (IMPORTANT) count forward or backward by ones starting with any number less than 999.
- The learner will be able to (IMPORTANT) apply an efficient grouping method to count a group of objects up to one hundred (e.g., two's, three's, five's, ten's).

- The learner will be able to (ESSENTIAL) solve problems using counting.
- The learner will be able to (ESSENTIAL) comprehend the concepts of equivalent forms.
- The learner will be able to (ESSENTIAL) use estimation in solving problems.
- The learner will be able to (IMPORTANT) estimate to assess the reasonableness of a calculation.
- The learner will be able to (ESSENTIAL) identify even numbers.
- The learner will be able to (ESSENTIAL) conceptually understand expanded notation.
- The learner will be able to (IMPORTANT) match the spoken, written, concrete, and pictorial representations of halves, thirds, and fourths.
- The learner will be able to (IMPORTANT) solve problems, compute fluently, and make reasonable estimates.
- The learner will be able to (ESSENTIAL) model problem scenarios.
- The learner will be able to (IMPORTANT) count a collection of coins with a value up to \$1.00.
- The learner will be able to (IMPORTANT) represent numbers to 999 in flexible ways using a variety of materials (e.g., 23 as 23 ones, 1 ten and 13 ones, or 2 tens and 3 ones).
- The learner will be able to (IMPORTANT) apply a number line to demonstrate addition and subtraction.
- 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) write and describe addition and subtraction sentences that are related.
- The learner will be able to (IMPORTANT) identify number sentences that illustrate scenarios involving addition and subtraction.

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- The learner will be able to (IMPORTANT) identify odd and even numbers up to 100.
- The learner will be able to (ESSENTIAL) identify odd numbers.
- The learner will be able to (IMPORTANT) order whole numbers less than 1000.
- The learner will be able to (IMPORTANT) use ordinal number language up to twentieths.
- The learner will be able to (ESSENTIAL) understand ordinal numbers.
- The learner will be able to (IMPORTANT) understand the meaning of operations and how they relate to each other.
- The learner will be able to (ESSENTIAL) comprehend number patterns.
- 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) use number patterns.
- The learner will be able to (IMPORTANT) identify the place value of any digit in numbers up to 999.
- The learner will be able to (ESSENTIAL) understand the concept of place value.
- The learner will be able to (ESSENTIAL) obtain solutions to non-routine problems.
- The learner will be able to (IMPORTANT) read and write whole numbers to 999.
- The learner will be able to (IMPORTANT) explain and justify problem solving strategies.
- The learner will be able to (IMPORTANT) evaluate the reasonableness of a given solution.
- The learner will be able to (IMPORTANT) obtain solutions to word problems involving numbers up to one hundred.
- The learner will be able to (IMPORTANT) create a story problem that corresponds to a given addition or subtraction number sentence.