

A Blueprint for Learning Mathematics Fifth Grade

The *Blueprint for Learning* is a companion document for the Tennessee Curriculum Standards which are located at www.tennessee.gov/education. Although the curriculum adopted by the State Board of Education in its entirety remains on the web for additional reference, this reformatted version makes the curriculum more accessible to classroom teachers.

Key features of the reformatted version are:

- All grades for each content area are provided in the printed manual.
- The skills within each grade are identified as to whether they are introduced, developed, or have been mastered and are now being maintained at that level.
- The skills correlating with the state criterion referenced test (CRT) are also identified for classroom instruction.
- In the Language Arts section, the assessed skills (performance indicators) are identified not only for the state's CRT in grades 3-8 but also for the writing assessment in grades 5 and 8.
- This guide makes the planning of instruction for students with varying abilities easier to accomplish.
- Teachers can plan and work together to improve school wide student achievement through curriculum integration across content areas and grade levels.
- Teachers can identify current grade level skills as well as those needed to prepare students for the next year.

Skills are coded and identified as Introduced (I), Developing (D), State CRT and Writing Assessed (A), and Mastered and Maintained (M).

- Introduced (I) skills are new skills presented at that grade level. Even though a skill is considered introduced at a grade level, some development would also occur.
- Developing (D) skills are skills that have been introduced at a previous grade level. At this stage of development the skills are being refined and expanded.
- Assessed (A) skills are those skills that are correlated to the state performance indicators for the CRT portion of the achievement test (grades 3-8) and the writing assessment (grades 5 and 8). The identified skills are formally assessed through the CRT; however, all skills are informally assessed in the classroom.
 - For the purpose of data reporting, assessed (A) skills are grouped into categories indicating related skills and knowledge. For example, grammar, mechanics, and usage are grouped together under the grammar (G) category. Each state assessed indicator included on the Blueprint carries a legend showing that it is assessed and indicating the category in which it will be reported (e.g., Assessed/Grammar=A/G).
- Mastered and Maintained (M) indicates a skill that has been introduced, developed, and assessed. Even though a skill may be formally assessed, the development and expansion of the skill still continues.

KEY

I = Introduced D = Developing A = State Assessed M = Mastered

REPORTING CATEGORY

N = Number & Operations AT = Algebraic Thinking C = Computation R = Real World Problem Solving
DP = Data Analysis & Probability ME = Measurement G = Geometry GR = Graphs & Graphing

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MATHEMATICS Fifth Grade

Color Coding for State Performance Indicators:

SPI's Level 1-Basic

SPI's Level 2-Proficient

SPI's Level 3-Advanced

NUMBER AND OPERATIONS

The student will identify, represent, order, and compare numbers; and estimate, compute, and solve problems.

Key	SPI's	Reporting Category	
A	1.1	N	Read and write numbers from millions to thousandths.
A	2.2	N	Identify the place value of a given digit from millions to thousandths.
A	1.3	N	Represent whole numbers and two-place decimals in expanded form.
A	2.3	N	Represent, compare, and order whole numbers and decimals to thousandths.
D			Order and compare (<, >, or =) whole numbers, fractions, mixed numbers, and decimals using models (e.g., number lines, base ten blocks, Venn diagrams, and hundreds boards).
A	2.8	N	Compare and order fractions using the appropriate symbol (<, >, and =).
D			Demonstrate knowledge and understanding of grade level mathematical terms.
D			Represent proper fractions, improper fractions, and mixed numbers using concrete objects, pictures, and the number line.
A	1.2	N	Connect symbolic representations of proper and improper fractions to models of proper and improper fractions.
A	2.7	N	Represent numbers as both improper fractions and mixed numbers.
D			Identify and change improper fractions to mixed numbers and vice versa.
A	3.1	N	Generate equivalent forms of commonly used fractions, decimals, and percents (e.g., 1/10, 1/4, 1/2, .75, 50%).
D			Recognize relationships among commonly used fractions and decimals.
A	3.2	C	Multiply a fraction by a multiple of its denominator (denominator less than or equal to 10).
M			Use commutative, associative, and identity properties.
D			Explain and demonstrate the inverse nature of addition and subtraction.
D			Explain and demonstrate the inverse nature of multiplication and division.
D			Explain how addition, subtraction, multiplication, and division affect the size and order of numbers.
D			Select appropriate methods and tools for computations (e.g., mental computation, estimation, calculators, and paper and pencil).
I			Explain why one form of a number might be more useful for computation than another form.
A	2.4	N	Use estimation to determine a reasonable solution to a whole number computation.
A	2.1	C	Add, subtract, multiply, and divide whole numbers (multipliers and divisors no more than two-digits).
A	2.5	C	Add, subtract, and multiply decimals.
A	2.9	C	Add and subtract commonly used fractions.
D			Identify missing information and/or too much information in real-world problems.
A	2.6	R	Solve one- or two-step real-world problems involving addition, subtraction, and/or multiplication of whole numbers and decimals.
D			Solve real-world problems using decimals (including money), fractions, and percents.

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ALGEBRA

The student will analyze and use symbols to generalize patterns, use properties of operations, and analyze change in various situations.

D			Generalize and extend or complete patterns involving geometric figures or numbers.
A	1.4	AT	Extend numerical patterns.
A	1.5	AT	Extend geometric patterns.
A	3.3	AT	Generalize numerical patterns using a variable.
D			Represent and analyze patterns and functions using words, tables, and graphs.
D			Determine or apply a function rule involving data in a function table.
A	2.10	AT	Apply basic function rules.
M			Demonstrate understanding that an equation is a number sentence stating two quantities are equal.
A	2.12	AT	Solve open sentences involving addition, subtraction, multiplication, and division.
A	2.11	AT	Connect open sentences to real-world situations.
D			Represent the idea of a variable as an unknown quantity using a letter or a symbol.
A	3.4	AT	Select an equation that represents a given mathematical relationship.
M			Apply commutative, associative, zero, distributive, and identity properties.
M			Show that division is not commutative.
D			Investigate how a change in one variable relates to a change in a second variable.
D			Use methods to compare and describe situations involving constant and/or varying rates of change and to solve real-world problems (e.g., extending rate charts).
A	3.5	R	Extend rate charts to solve real-world problems.

GEOMETRY

The student will analyze and describe characteristics and properties of 2- and 3-dimensional shapes, locate and specify points on a grid, and use geometric concepts (e.g., symmetry and transformations) and reasoning to solve problems.

D			Identify, compare, and analyze attributes of two- and three-dimensional figures.
A	1.7	G	Identify lines of symmetry in two-dimensional geometric figures.
A	2.3	G	Identify two- or three- dimensional shapes given defining attributes.
D			Use the attributes of geometric figures to develop definitions of the figures.
A	1.6	G	Identify lines, line segments, rays, and angles.
D			Identify and draw points, lines, line segments, rays, and angles.
D			Draw circles and label diameter, circumference, radius, and center.
A	3.6	G	Classify geometric figures using properties.
D			Investigate and describe the results of subdividing and combining geometric figures.
D			Recognize, name, compare, and contrast congruent and symmetrical geometric figures.
D			Describe the relationships between lines and the characteristics of angles (e.g., parallel, perpendicular, intersecting, right, acute, obtuse, and straight).
I			Make and test hypothesis about geometric properties.
I			Explore similarity and how the sides and angles of similar triangles are related.
D			Describe location and movement using appropriate mathematical language.
A	2.5	AT	Locate and specify a point in Quadrant I of a coordinate system.
D			Identify, predict, and describe the results of transformations of two-dimensional figures (i.e., slides, flips, and turns).
A	3.3	G	Use spatial reasoning to predict the result of sliding, flipping, or turning a two-dimensional shape.

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I			Describe and identify line and rotational symmetry in two-dimensional figures.
D			Describe a motion or a series of motions that will show that two shapes are congruent.
D			Construct and draw two- and three-dimensional geometric figures.
D			Create and describe mental images of objects, patterns, and paths.
D			Recognize and build a 3-dimensional object from a 2-dimensional representation (net) of that object (e.g., cube, rectangular prism, pyramid, cone, or cylinder).
A	2.14	G	Use spatial reasoning to identify the three-dimensional figure created from a two-dimensional representation (net) of that figure (i.e., cube, rectangular prism, pyramid, cone, or cylinder).
I			Use visualization and spatial reasoning (e.g., geometric models) to solve problems.

MEASUREMENT

The student will determine time, length, perimeter, area, weight, capacity, and temperature and solve real-world problems involving measurement.

D			Demonstrate understanding of the concepts of length, perimeter, circumference, area, weight, capacity, volume, elapsed time, and angle measure.
D			Demonstrate understanding that measurements are approximations.
I			Understand how differences in units affect precision of measurements.
D			Demonstrate understanding of the relationships among the units within both customary and metric systems of measurement.
A	2.17	ME	Connect simple units of measurement within the same system of measurement.
A	1.10	ME	Use estimation to determine if a length or volume measurement is reasonable.
A	2.16	ME	Select appropriate standard units to measure length, perimeter, area, capacity, volume, weight, time, temperature, and angles.
D			Explore what happens to measurements of a two-dimensional shape when the shape is changed in some way (e.g., perimeter, area).
A	2.18	ME	Use strategies to estimate perimeter and area of rectangles.
D			Select and use appropriate standard units to measure length, perimeter, area, capacity, volume, weight, time, temperature, and angles.
D			Select and use appropriate tools for measuring in real-world situations.
A	1.9	ME	Use a ruler to measure to the nearest centimeter and $\frac{1}{4}$ inch.
A	1.11	R	Solve real-world problems involving addition and subtraction of measurements.
A	3.9	R	Solve real-world problems involving perimeter and area of rectangles.
A	2.19	R	Solve real-world problems involving elapsed time.
A	1.8	ME	Read temperatures on a thermometer using Fahrenheit and Celsius scales.
A	3.8	ME	Apply formulas to find the area of parallelograms and triangles.
D			Explain and demonstrate how scale in maps and drawings shows relative size and distance.
I			Develop informal strategies to determine the surface area and volume of rectangular solids.

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DATA ANALYSIS AND PROBABILITY

The student will collect, organize, analyze, interpret, and display data in tables and graphs and determine the probabilities of outcomes in simple experiments.

D			Collect data using observations, surveys, and experiments.
D			Understand how data-collection methods could affect the results.
A	1.2, 1.3	DP	Represent and interpret data in bar graphs and pictographs.
D			Represent data using pictographs, bar graphs, tables, circle graphs, and line graphs.
D			Interpret data displayed in pictographs, bar graphs, tables, circle graphs, and line graphs.
D			Use measures of central tendency (i.e., mean, median, and mode).
A A	3.10, 2.20, 2.21	DP	Determine the mean, median, and mode of a data set.
I			Find the range of a data set.
D			Make predictions and justify conclusions based on data.
A	3.11	AT	Make predictions based on data.
D			Design investigations to address a question.
D			Examine various graphical representations of data to evaluate how accurately the data is depicted.
I			Explain the importance of sample size in investigations.
D			Describe the likelihood or chance of events as likely, unlikely, certain, equally likely, or impossible.
A	2.22	DP	Determine the most likely, least likely, or equally likely outcomes in simple experiments.
D			Use a sample space to predict the probability of an event.
A	2.23	DP	Represent the likelihood of an event using a fractional number from zero to one.

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