



CRCT Content Descriptions

based on the Georgia Performance Standards

Mathematics

Grades (-)



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Criterion-Referenced Competency Tests (CRCT)
Content Descriptions
Mathematics

Georgia law requires the development and administration of the CRCT in the content areas of Reading, English/Language Arts, Mathematics, Science, and Social Studies. Each spring students in grades 1 through 8 take the Reading, English/Language Arts, and Mathematics CRCT, while students in grades 3 through 8 also take the Science and Social Studies CRCT. These tests are designed to measure student achievement of the Georgia Performance Standards (GPS).

Program Purpose

The CRCT is designed to measure student acquisition and understanding of the knowledge, concepts, and skills set forth in the GPS. The testing program serves as a measure of the quality of education in the state. Reports yielding information on academic achievement at the student, class, school, system, and state levels are produced annually.

Mandated Grades for Mathematics

Grades 1 through 8 are mandated to participate in the Mathematics CRCT each spring.

CRCT Content Descriptions

The CRCT Content Descriptions are provided to acquaint Georgia educators with the content coverage of the CRCT. Only the knowledge, concepts, and skills reflected in the GPS will be assessed on the CRCT. Committees of Georgia educators reviewed the curriculum and provided guidance for the assessment program.

It is important to note that some curricular standards are better suited for classroom or individual assessment rather than large-scale, paper-pencil assessment. While those curricular standards designed for classroom/individual assessment are not included in the Content Descriptions, the knowledge, concepts, and skills outlined are often required for the mastery of the standards that are assessed. Therefore, the CRCT Content Descriptions are in *no way* intended to substitute for the GPS; they are provided to help educators better understand how the curriculum will be assessed. Further, the CRCT Content Descriptions, *by no means*, suggest *when* concepts and skills should be introduced in the instructional sequence; rather, its purpose is to communicate when concepts and skills will be assessed on the CRCT. Georgia law requires educators to teach the standards set forth in the state-adopted curriculum (i.e., the GPS). The GPS is located at <http://www.georgiastandards.org>.

Mathematics Content Domains

To provide reliable measures as well as structure to the assessment program, the curricular standards provided in the GPS were grouped into content domains. Each domain is comprised of standards with similar content characteristics. The domains for Mathematics are:

Grade 1–2

Number and Operations

Measurement

Geometry

Data Analysis and Probability

Grade 6

Number and Operations

Measurement

Geometry

Algebra

Data Analysis and Probability

Grade 3–5

Number and Operations

Measurement

Geometry

Algebra

Data Analysis

Grade 7–8

Number and Operations

Geometry

Algebra

Data Analysis and Probability

The GPS in mathematics requires that mathematical concepts be taught in the context of real world phenomena. The mathematical process standards require students to solve single and multi-step routine and non-routine word problems while implementing a variety of problem solving strategies. The process standards concepts and skills are taught and applied within context rather than merely following a prescribed algorithm. The concepts and skills inherent in the process standards are integrated in items across the five content domains.

Using the Mathematics CRCT Content Descriptions

The Mathematics CRCT Content Descriptions provide information about the content and skills assessed by the CRCT. The documents are organized by grade and content domain. The curriculum standards assessed in each domain are provided as are the related concepts, skills, and abilities assessed. It is important to note the differences between the GPS and the former curriculum. The GPS is a conceptual curriculum, requiring instruction be integrated; the concepts, knowledge, skills, and abilities described in this document should not be viewed as discrete or taught in isolation. Deep understanding by students, resulting in higher achievement, is best achieved when the full curriculum is taught in an integrated, conceptual fashion.

Mathematics

Grade: 4

Domain: Number and Operations

Domain Description

Number and Operations refers to students' skill in further developing understanding of numbers and mastering the four basic operations with whole numbers by solving problems. This domain also refers to students' skill in understanding rounding and its appropriate use and adding and subtracting decimals and common fractions with common denominators.

Standards Associated with Domain

M4N1	M4N2	M4N3	M4N4
M4N5	M4N6	M4N7	

Associated Concepts, Skills, and Abilities

- Identify place value names and places from hundredths through one million
- Equate a number's word name, its standard form, and its expanded form
- Round numbers to the nearest ten, hundred, or thousand
- Describe situations in which rounding numbers would be appropriate and determine whether to round to the nearest ten, hundred, or thousand
- Understand the meaning of rounding a decimal to the nearest whole number
- Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers
- Solve problems involving multiplication of 2-3 digit numbers by 1-2 digit numbers
- Know the division facts with understanding and fluency
- Solve problems involving division by a 2-digit number (including those that generate a remainder)
- Understand the relationship between dividend, divisor, quotient, and remainder
- Understand and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number ($2050 \div 50$ yields the same answer as $205 \div 5$)
- Understand decimals are a part of the base-ten system
- Understand the relative size of numbers and order two digit decimals
- Add and subtract both one and two digit decimals
- Model multiplication and division of decimals by whole numbers
- Multiply and divide both one and two digit decimals by whole numbers
- Understand representations of simple equivalent fractions
- Add and subtract fractions and mixed numbers with common denominators (Denominators should not exceed twelve)
- Convert and use mixed numbers and improper fractions interchangeably
- Describe situations in which the four operations may be used and the relationships among them
- Compute using the order of operations, including parentheses
- Compute using the commutative, associative, and distributive properties
- Use mental math and estimation strategies to compute

Mathematics**Grade:** 4**Domain:** Measurement**Domain Description**

Measurement refers to students' skill in understanding weight, using appropriate metric and standard units, and in measuring angles.

Standards Associated with Domain

M4M1

M4M2

Associated Concepts, Skills, and Abilities

- Use standard and metric units to measure the weight of objects
- Know units used to measure weight (gram, kilogram, ounce, pound, and ton)
- Compare one unit to another within a single system of measurement
- Use tools, such as a protractor or angle ruler, and other methods, such as paper folding or drawing a diagonal in a square, to measure angles
- Understand the meaning and measure of a half rotation (180°) and a full rotation (360°)

Mathematics

Grade: 4

Domain: Geometry

Domain Description

Geometry refers to students' skill in understanding the characteristics of plane and solid geometric figures and using the coordinate system.

Standards Associated with Domain

M4G1

M4G2

M4G3

Associated Concepts, Skills, and Abilities

- Examine and compare angles in order to classify and identify triangles by their angles
- Describe parallel and perpendicular lines in plane geometric figures
- Examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi)
- Compare and contrast the relationships among quadrilaterals
- Compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices
- Describe parallel and perpendicular lines and planes in connection with rectangular prisms
- Construct/collect models for solid geometric figures (cubes, prisms, cylinders, etc.)
- Understand and apply ordered pairs in the first quadrant of the coordinate system
- Locate a point in the first quadrant in the coordinate plane and name the ordered pair
- Graph ordered pairs in the first quadrant

Mathematics**Grade:** 4**Domain:** Algebra**Domain Description**

Algebra refers to students' skill in understanding and representing mathematical relationships between quantities using mathematical expressions in problem-solving situations.

Standard Associated with Domain

M4A1

Associated Concepts, Skills, and Abilities

- Understand and apply patterns and rules to describe relationships and solve problems
- Represent unknowns using symbols, such as \square and Δ
- Write and evaluate mathematical expressions using symbols and different values

Mathematics**Grade:** 4**Domain:** Data Analysis**Domain Description**

Data Analysis refers to students' skill in gathering, organizing, and displaying data. This domain also refers to students' skill in comparing features of graphs

Standard Associated with Domain

M4D1

Associated Concepts, Skills, and Abilities

- Represent data in bar, line, and pictographs
- Investigate the features and tendencies of graphs
- Compare different graphical representations for a given set of data
- Identify missing information and duplications in data

Mathematics

Grade: 4

Mathematical Process Skills

Mathematical Process Skills are integrated across the five domains.

Mathematical Process Skills refers to students' dexterity in applying concepts and skills in the context of authentic problems and understanding concepts rather than merely following a sequence of procedures. Process skills are used to acquire and apply content knowledge.

Process skills include solving problems that arise in mathematics and other contexts; reasoning and evaluating mathematical arguments; communicating mathematically; making connections among mathematical ideas and to other content areas; and representing mathematical ideas in multiple ways.

Standards Associated with Domain

M4P1

M4P2

M4P3

M4P4

M4P5

Associated Concepts, Skills, and Abilities

- Build new mathematical knowledge through problem solving
- Solve problems that arise in mathematics and in other contexts
- Apply and adapt a variety of appropriate strategies to solve problems
- Monitor and reflect on the process of mathematical problem solving
- Recognize reasoning and proof as fundamental aspects of mathematics
- Make and investigate mathematical conjectures
- Develop and evaluate mathematical arguments and proofs
- Select and use various types of reasoning and methods of proof
- Organize and consolidate their mathematical thinking through communication
- Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
- Analyze and evaluate the mathematical thinking and strategies of others
- Use the language of mathematics to express mathematical ideas precisely
- Recognize and use connections among mathematical ideas
- Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
- Recognize and apply mathematics in contexts outside of mathematics
- Create and use representations to organize, record, and communicate mathematical ideas
- Select, apply, and translate among mathematical representations to solve problems
- Use representations to model and interpret physical, social, and mathematical phenomena

Mathematics

Grade: 5

Domain: Number and Operations

Domain Description

Number and Operations refers to students' skill in further developing understanding of numbers, the meanings of multiplication and division of decimals, and the use of decimals and common fractions in computation and problem solving.

Standards Associated with Domain

M5N1

M5N2

M5N3

M5N4

M5N5

Associated Concepts, Skills, and Abilities

- Classify the set of counting numbers into subsets with distinguishing characteristics (odd/even, prime/composite)
- Find multiples and factors
- Analyze and use divisibility rules
- Understand place value
- Analyze the effect on the product when a number is multiplied by 10, 100, 1000, 0.1, and 0.01
- Model multiplication and division of decimals by another decimal
- Explain the process of multiplication and division, including situations in which the multiplier and divisor are both whole numbers and decimals
- Multiply and divide with decimals including decimals less than one and greater than one
- Understand that the relationships and rules for multiplication and division of whole numbers also apply to decimals
- Understand division of whole numbers can be represented as a fraction ($a/b = a \div b$)
- Understand the value of a fraction is not changed when both its numerator and denominator are multiplied or divided by the same number because it is the same as multiplying or dividing by one
- Find equivalent fractions and simplify fractions
- Model the multiplication and division of common fractions
- Explore finding common denominators using concrete, pictorial, and computational models
- Use $<$, $>$, or $=$ to compare fractions and justify the comparison
- Add and subtract common fractions and mixed numbers with unlike denominators
- Use fractions (proper and improper) and decimals interchangeably
- Estimate products and quotients
- Model percent on 10 by 10 grids
- Apply percentage to circle graphs

Mathematics

Grade: 5

Domain: Measurement

Domain Description

Measurement refers to students' skill in understanding and computing the areas of geometric plane figures, the volumes of simple geometric solids, and the measurement of capacity. This domain also refers to students' skill in converting measures from one unit to another within a system of measurement.

Standards Associated with Domain

M5M1

M5M3

M5M4

Associated Concepts, Skills, and Abilities

- Estimate the area of fundamental geometric plane figures
- Derive the formula for the area of a parallelogram (e.g., cut the parallelogram apart and rearrange it into a rectangle of the same area)
- Derive the formula for the area of a triangle (e.g. demonstrate and explain its relationship to the area of a rectangle with the same base and height)
- Find the areas of triangles and parallelograms using formulae
- Estimate the area of a circle through partitioning and tiling and then find the area of a circle with formula (let $\pi = 3.14$). (Discuss square units as they apply to circles.)
- Find the area of a polygon (regular and irregular) by dividing it into squares, rectangles, and/or triangles and finding the sum of the areas of those shapes
- Use milliliters, liters, fluid ounces, cups, pints, quarts, and gallons to measure capacity
- Compare one unit to another within a single system of measurement (e.g., 1 quart = 2 pints)
- Understand a cubic unit (u^3) is represented by a cube in which each edge has the length of 1 unit
- Identify the units used in computing volume as cubic centimeters (cm^3), cubic meters (m^3), cubic inches (in^3), cubic feet (ft^3), and cubic yards (yd^3)
- Derive the formula for finding the volume of a cube and a rectangular prism using manipulatives
- Compute the volume of a cube and a rectangular prism using formulae
- Estimate the volume of a simple geometric solid
- Understand the similarities and differences between volume and capacity

Mathematics**Grade: 5****Domain: Geometry****Domain Description**

Geometry refers to students' skill in understanding geometric figures, including congruence; the correspondence of their vertices, sides, and angles; and the relationship pi to circles.

Standards Associated with Domain

M5G1

M5G2

Associated Concepts, Skills, and Abilities

- Understand congruence of geometric figures and the correspondence of their vertices, sides, and angles
- Understand the relationship of the circumference of a circle, its diameter, and pi ($\pi = 3.14$)

Mathematics**Grade: 5****Domain: Algebra****Domain Description**

Algebra refers to students' skill in understanding, representing, and investigating mathematical expressions algebraically by using variables.

Standard Associated with Domain

M5A1

Associated Concepts, Skills, and Abilities

- Use variables, such as n or x , for unknown quantities in algebraic expressions
- Investigate simple algebraic expressions by substituting numbers for the unknown
- Determine that a formula will be reliable regardless of the type of number (whole numbers or decimal fractions) substituted for the variable

Mathematics**Grade: 5****Domain:** Data Analysis**Domain Description**

Data Analysis refers to students' skill in gathering, organizing, and displaying data. This domain also refers to students' skill in interpreting graphs.

Standards Associated with Domain

M5D1

M5D2

Associated Concepts, Skills, and Abilities

- Analyze data presented in a graph
- Compare and contrast multiple graphic representations (circle graphs, line graphs, bar graphs, etc.) for a single set of data and discuss the advantages/disadvantages of each
- Collect, organize, and display data using the most appropriate graph

Mathematics

Grade: 5

Mathematical Process Skills

Mathematical Process Skills are integrated across the five domains.

Mathematical Process Skills refers to students' dexterity in applying concepts and skills in the context of authentic problems and understanding concepts rather than merely following a sequence of procedures. Process skills are used to acquire and apply content knowledge.

Process skills include solving problems that arise in mathematics and other contexts; reasoning and evaluating mathematical arguments; communicating mathematically; making connections among mathematical ideas and to other content areas; and representing mathematical ideas in multiple ways

Standards Associated with Domain

M5P1

M5P2

M5P3

M5P4

M5P5

Associated Concepts, Skills, and Abilities

- Build new mathematical knowledge through problem solving
- Solve problems that arise in mathematics and in other contexts
- Apply and adapt a variety of appropriate strategies to solve problems
- Monitor and reflect on the process of mathematical problem solving
- Recognize reasoning and proof as fundamental aspects of mathematics
- Make and investigate mathematical conjectures
- Develop and evaluate mathematical arguments and proofs
- Select and use various types of reasoning and methods of proof
- Organize and consolidate their mathematical thinking through communication
- Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
- Analyze and evaluate the mathematical thinking and strategies of others
- Use the language of mathematics to express mathematical ideas precisely
- Recognize and use connections among mathematical ideas
- Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
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- Create and use representations to organize, record, and communicate mathematical ideas
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- Use representations to model and interpret physical, social, and mathematical phenomena