



**CRCT Content Descriptions
based on the Georgia Performance Standards**

**Science
Grades 3 - 8**



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Criterion-Referenced Competency Tests (CRCT)
Content Descriptions
Science

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 Science

Grades 3 through 8 are mandated to participate in the Science 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>.

Science 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 Science are:

Grade 3–5

Earth Science

Physical Science

Life Science

Grade 6: Earth Science

Astronomy

Hydrology and Meteorology

Geology

Grade 7: Life Science

Cells and Genetics

Interdependence of Life

Evolution

Grade 8: Physical Science

Structure of Matter

Force and Motion

Energy and its Transformations

The GPS in science requires that content be taught in conjunction with process skills identified as the Characteristics of Science. Characteristics of Science refers to the process skills used in the learning and practice of science, such as testing a hypothesis, record keeping, using correct safety procedures, using appropriate tools and instruments, applying math and technology, analyzing data, interpreting results, and communicating scientific information. It also refers to understanding how science knowledge grows and changes and the processes that drive those changes. The concepts and skills inherent in Characteristics of Science are integrated in items across the three content domains.

Using the Science CRCT Content Descriptions

The Science 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.

Science

Grade: 5

Domain: Earth Science

Domain Description

Earth Science refers to identifying surface features caused by weathering, erosion, deposition, earthquakes, volcanoes, faults, and organisms. This domain also refers to understanding how technology and human intervention is used to control these processes.

Standards Associated with Domain

S5E1

Associated Concepts, Skills, and Abilities

- Distinguish between surface features caused by constructive processes, such as:
 - deposition (deltas, sand dunes, etc.)
 - earthquakes
 - volcanoes
 - faults
- Distinguish between surface features caused by destructive processes, such as:
 - erosion (water and wind)
 - weathering
 - impact of organisms
 - earthquakes
 - volcanoes
- Determine and evaluate the role of technology and human intervention in the control of constructive and destructive processes, such as:
 - seismological studies
 - flood control (dams, levees, storm drain management, etc.)
 - beach reclamation (Georgia coastal islands)

Science

Grade: 5

Domain: Physical Science

Domain Description

Physical Science refers to explaining that objects are made of parts and the mass of an object is the sum of its parts. This domain also refers to comparing and contrasting physical and chemical changes, and describing the relationship between electricity and magnetism.

Standards Associated with Domain

S5P1

S5P2

S5P3

Associated Concepts, Skills, and Abilities

- Demonstrate understanding that the mass of an object is equal to the sum of its parts by manipulating and measuring different objects made of various parts
- Determine that common items have parts that are too small to be seen without magnification
- Identify examples of physical change, such as:
 - separating mixtures
 - manipulating paper (cutting, tearing, and folding)
- Explain that temperature differences can cause a physical change/change of state in water, such as:
 - water vapor/steam
 - liquid
 - ice
- Investigate the properties of a substance before, during, and after a chemical reaction to find evidence of change
- Describe static electricity
- Determine the necessary components for completing an electric circuit
- Classify common materials as insulators or conductors of electricity
- Compare a bar magnet to an electromagnet

Science

Grade: 5

Domain: Life Science

Domain Description

Life Science refers to classifying organisms into groups, comparing and contrasting learned and inherited traits, and explaining how genes transfer traits. This domain also refers to using diagrams to identify features of cells, comparing and contrasting single- and multi-celled organisms, and identifying beneficial and harmful microorganisms.

Standards Associated with Domain

S5L1

S5L2

S5L3

S5L4

Associated Concepts, Skills, and Abilities

- Demonstrate how animals are sorted in the following groups:
 - fish
 - amphibian
 - reptile
 - bird
 - mammal
- Explain how plants are sorted into groups
- Compare and contrast the characteristics of learned behaviors and inherited traits
- Describe what a gene is and the role genes play in the transfer of traits
- Explain how magnifiers such as microscopes or hand lenses are used to observe cells and their structure
- Recognize and determine the function of the parts of a plant cell, such as:
 - membrane
 - wall
 - cytoplasm
 - nucleus
 - chloroplasts
- Recognize and determine the function of the parts of an animal cell, such as:
 - membrane
 - cytoplasm
 - nucleus
- Distinguish between the structure and function of cells in multi-celled organisms and single-celled organisms
- Identify beneficial microorganisms and explain why they are beneficial
- Identify harmful microorganisms and explain why they are harmful

Science

Grade: 5

Characteristics of Science

Characteristics of Science items are integrated across the three content domains.

Characteristics of Science refers to understanding the process skills used in the learning and practice of science. These skills include testing a hypothesis, record keeping, using correct safety procedures, using appropriate tools and instruments, applying math and technology, analyzing data, interpreting results, and communicating scientific information. Characteristics of Science also refers to understanding how science knowledge grows and changes and the processes that drive those changes.

Standards Associated with Characteristics of Science

S5CS1	S5CS2	S5CS3	S5CS4
S5CS5	S5CS6	S5CS7	S5CS8

Associated Concepts, Skills, and Abilities

- Demonstrate understanding that records of investigations and observations should not be altered
- Distinguish observations from ideas and speculation about those observations
- Offer reasons for findings and consider reasons suggested by others
- Add, subtract, multiply, and divide whole numbers through different means, such as:
 - mentally
 - on paper
 - with a calculator
- Compute scientific calculations using decimals and commonly encountered fractions, such as:
 - halves
 - thirds
 - fourths
 - fifths
 - tenths
 - hundredths
- Evaluate measurements and computations of quantities and decide if they are reasonable answers to scientific problems by comparing them to typical values in dimensions, such as:
 - length
 - area
 - volume
 - weight
 - time
- Determine appropriate common materials for making simple mechanical constructions and repairing things
- Explain how to measure and mix dry and liquid materials in prescribed amounts while exercising reasonable safety precautions
- Explain when to use computers, cameras, and recording devices for capturing information

- Implement accepted safety procedures while manipulating science materials and equipment
- Observe and describe how parts influence one another in things with many parts
- Represent features of objects, events, and processes in the real world by constructing representations, such as:
 - geometric figures
 - number sequences
 - graphs
 - diagrams
 - sketches
 - number lines
 - maps
 - stories
- Describe patterns of change—such as steady, repetitive, or irregular change—using appropriate forms, such as:
 - records
 - tables
 - graphs of measurements
- Identify the largest and the smallest possible values of something
- Construct instructions that others can follow in carrying out a scientific procedure
- Evaluate sketches used to aid in explaining scientific procedures or ideas
- Use numerical data to describe and compare objects and events, and to explore scientific or technological matters
- Evaluate sources of scientific information, such as:
 - reference books
 - back issues of newspapers and magazines
 - CD-ROMs
 - computer databases
- Recognize when comparisons might not be fair because some conditions are different
- Explain that similar scientific investigations seldom produce exactly the same results due to circumstances, such as:
 - unexpected differences in what is being investigated
 - unrecognized differences in the methods or circumstances of the investigation
 - observational uncertainties
- Demonstrate understanding that although some scientific knowledge is very old, it is still applicable today
- Determine that scientific investigations may take many different forms, such as:
 - surveying what things are like
 - observing what is happening
 - collecting specimens for analysis
 - doing experiments

- Justify the reasons why clear and active communication is an essential part of doing science, such as:
 - enabling scientists to inform others about their work
 - allowing scientists to expose their ideas to criticism by other scientists
 - helping scientists stay informed about scientific discoveries around the world
- Describe ways scientists use technology to increase their acuity in such activities as:
 - observing
 - measuring
 - comparing
- Demonstrate understanding that science involves many different kinds of work and engages men and women of all ages and backgrounds