Cranston Public Schools
District Curriculum Framework

Science K–12

2010–2011

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District Curriculum Framework

Science K–12

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The Rhode Island science Grade Span Expectations constitute the foundation of these curriculum documents. These state standards, as well as released items from the New England Common Assessment Program (NECAP) and additional resources for implementing the standards, may be found at **www.ride.ri.gov/instruction/curriculum**, a website of the Rhode Island Department of Elementary and Secondary Education (also known as RIDE—the Rhode Island Department of Education).

About the development of this resource

These curriculum documents were created through a collaboration between Cranston Public Schools and the Charles A. Dana Center at The University of Texas at Austin. This work was part of a broader statewide effort in Rhode Island, sponsored and strongly supported by the **Rhode Island Department of Education (RIDE).**

This is the first edition of this resource. July 2010 release.

Note that the materials cited in the Resources sections of these documents have been purchased by the Cranston Public Schools.

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About the Building a Strong Foundation initiative

Building a Strong Foundation: Improving Student Achievement in Mathematics and Science is a collaboration of the Rhode Island Department of Elementary and Secondary Education and the Charles A. Dana Center at The University of Texas at Austin. Its purpose is to increase student achievement in mathematics and science in Rhode Island public schools. Cranston Public Schools is one of the state's school districts that has elected to participate in this initiative. For more information about the Building a Strong Foundation work, see the Rhode Island Department of Education website page at **www.ride.ri.gov/instruction/mathsci.aspx**.

About Cranston Public Schools

Cranston Public Schools, located in Cranston, Rhode Island (population 80,000), serves a population of over 10,000 students in grades kindergarten through 12. The district includes three high schools, three middle schools, and seventeen elementary schools. For more information on Cranston Public Schools, please visit its homepage at **www.cps.k12.ri.us**.

About the Charles A. Dana Center at The University of Texas at Austin

The Dana Center works to raise student achievement in K–16 mathematics and science, especially for historically underserved populations. It does so by providing direct service to school districts and institutions of higher education; to local, state, and national education leaders; and to nonprofits, agencies, and professional organizations concerned with strengthening American mathematics and science education. The Center is committed to ensuring that the accident of where a child attends school does not limit the academic opportunities he or she can pursue. For more information and to access Center resources (many of them free), please see **www.utdanacenter.org.**

Cranston Public Schools, in collaboration with the
                                        Charles A. Dana Center at the University of Texas at Austin

Science K–12
District Curriculum Framework
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STANDARDS
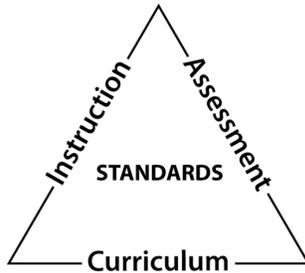
Curriculum

Purpose: Increase student achievement in science in Cranston Public School District by aligning curriculum, instruction, and assessment to the state standards.

Objectives:	Actions:	Roles and Responsibilities:
1. Implement the guaranteed and viable curriculum every day, in every classroom, for every student. 2. Provide regular opportunities for teachers and leaders to collaboratively study and implement the curriculum. 3. Implement routines and structures for monitoring implementation of the curriculum and providing feedback.	Teachers, leaders, and Charles A. Dana Center staff will: a. Collaboratively generate district-level curriculum documents that delineate which GSEs (Grade Span Expectations) should be taught in each grade level, in what order, and for what duration. b. Engage in system-wide study of the state standards and district-developed curriculum documents. c. Develop and implement support structures and tools for leaders to increase their ability to support teachers in implementing the district curriculum. d. Refine and implement support structures and tools for teachers as they work collaboratively to plan and implement instruction that is aligned to the state standards and district curriculum.	*Central office staff will…* Provide monitoring and support of curriculum development and implementation, collaborate with teacher writing team members and Dana Center staff, and ensure that the work of the initiative is aligned to the district's overall plan for increasing student achievement in science. *Building leaders will…* Ensure teacher participation in professional development, provide regular opportunities for teachers to collaboratively plan and implement instruction aligned to the standards and curriculum, monitor implementation of the curriculum, and provide teachers with ongoing meaningful feedback. *Teachers will…* Attend and actively participate in professional development, implement the curriculum in every classroom for every child on every day, and regularly collaborate with grade level/department colleagues to plan and implement instruction aligned to the standards and curriculum documents. *The Charles A. Dana Center at the University of Texas at Austin will…* Provide technical expertise and on-site support for planning and implementing this work, facilitate the initial alignment work, and help Cranston Public School District build capacity in its system throughout this project.

Developing the Guaranteed and Viable Curriculum

Research[*] concludes that implementation of a guaranteed and viable curriculum plays a critical role in improving student achievement. *Guaranteed* means that every child in every school receives essential instruction every day; *viable* means that the curriculum can be taught in the amount of time provided. The District Curriculum Frameworks developed in this collaboration between Cranston Public Schools and the Dana Center outline the guaranteed and viable curriculum and define the essential knowledge that all students must learn in science at each grade level and in each course of study. Careful attention was given to the amount of time necessary to teach these essential knowledge and skills.

This guaranteed and viable curriculum for Cranston Public Schools was developed through careful study of—and alignment to—the state standards (the Rhode Island Grade Span Expectations, or GSEs and Grade-Level Expectations, or GLEs). This process of starting from state standards to identify essential student learning is referred to as *backloading*. The backloading process supported the development of the scope-and-sequence document for each grade level or course.

Teacher representatives from every grade level and course taught in the district worked in teams (K–4, 5–8, and 9–12) to determine which standards would be taught in each quarter for each grade level or course from kindergarten through grade 12. In addition, the teacher teams clustered standards into "big idea" groups called *units of study*. The teacher teams, working in collaboration with Dana Center staff, made the decisions about which standards best clustered together for each unit and in what sequence the units should be taught. For science, they made these decisions based on the GSEs and research from *Benchmarks for Science Literacy*, the *Atlas of Science Literacy*, and *Making Sense of Secondary Science*.

Structure of the District Curriculum Framework

The purpose of these district curriculum documents is to support quality implementation of the Rhode Island science GSEs every day, in every classroom, for every student—to ensure grade-level and subject-area alignment and coherence across the district. In the District Curriculum Framework documents for science, we have tried to identify which standards are taught, when, and for how long. We have also tried to clarify standards and describe the implications of the standards for each grade level or course.

The District Curriculum Framework documents do *not* provide daily lesson plans, eliminate the need for lesson planning, or recreate the teacher's edition of classroom resources. Rather, the curriculum framework provides a workplan that directs the instruction delivered in every classroom in every school in the district. The curriculum framework consists of the following sections.

Section A: Scope and Sequence

This section includes the relevant content standards (GSEs) taught in each unit of study, organized by quarter.

Section B: Year at a Glance: Units of Study by Quarter

This section lists the title of each unit of study for that grade or course along with the number of days needed to conduct the unit.

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[*]See, for example, Chapter 3, A Guaranteed and Viable Curriculum, pages 22–34 in Robert J. Marzano's *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development, 2003.

Section C: Units of Study

Important Note: The units of study are currently being developed by teams of educators from Cranston Public Schools, with support from the Dana Center. This section will be completed as the units are completed prior to the beginning of each quarter in the 2010–2011 school year.

These instructional units outline specific student outcomes aligned to the GSEs. These units are the heart of the District Curriculum Framework documents. Each unit of study provides detailed information to support lesson planning and is structured in two main sections:

- *Overview:* Each one-page unit overview lists the total number of days needed to teach the unit and defines expectations for student learning by articulating the content to be learned and processes to be used—that is, the standards-based expectations of which students will demonstrate understanding. The overview ends with a list of the Essential Questions that students should be able to answer by the end of the unit.

- *Written curriculum:* This section lists the specific parts of the relevant science GSEs to be taught during the unit. The Clarifying the Standards subsection provides an analysis of the ideas taught in the grade level(s) before (Prior Learning) and after (Future Learning) the grade level or course being taught. This subsection also clarifies what should be learned in the current grade level or course and reports important findings from research and the standards that support teachers in narrowing the idea in the standards to the content taught in the grade level.

Section D: Rhode Island Science K–12 Grade Span Expectations

These are complete copies of the state standards for science, to aid in effective collaboration around the District Curriculum Framework documents.