



# **Core Science Curriculum Framework**

**An Invitation for Students and Teachers  
to Explore Science and Its Role in Society**

## Introduction

### I. A Vision for Connecticut Science Education in the 21<sup>st</sup> Century

Toward the end of the 20<sup>th</sup> century the National Research Council published the National Science Education Standards, which stated that the goal of school science education should be **scientific literacy for all students**. In 2003, the Connecticut State Department of Education convened a committee of experienced educators to redesign its science framework and to define what all students should learn in their school science programs in order to make the vision of ‘science literacy for all’ a reality for Connecticut students.

The vision of the new framework is based on contemporary trends in science and society, including:

- the growing need for citizens to be scientifically literate in order to deal with science related personal and global issues;
- the growing availability and use of information technologies to access, analyze, share and communicate knowledge;
- the growing role of mission-oriented and applied science research in our society; and
- the evolving interdisciplinary nature of contemporary science knowledge and careers.

All students, regardless of their academic standing or career aspirations, should have access to a rich and challenging science curriculum that will assure them opportunities to acquire fundamental understandings about life, chemistry, physics and earth science content, as well as the ways in which science knowledge is generated and critiqued.

Although school districts will develop their own science curricula to meet the learning needs, interests and values of their own school communities, all school science programs should encourage and support student interest in and excitement about science by providing opportunities for students to become actively engaged with the content and nature of scientific endeavors. Therefore, the framework describes a coherent sequence of fundamental life, chemistry, physics and earth science concepts and skills that all students should learn through engaging intellectual and hands-on explorations of natural phenomena.

The science framework is based on content standards derived from the *National Science Education Standards* and the *Project 2061 Benchmarks for Science Literacy*. Acknowledging the fact that the current body of science knowledge is very large, encompassing different disciplines and continuously growing, the new science framework attempts to reduce the breadth of the content and identify the most important science concepts, processes and applications that all students should learn in order to become scientifically literate and pursue more advanced science studies.

### II. Framework Goals

The science framework has three main goals:

1. Articulating a vision for science education in Connecticut in which all students are engaged in the study of basic science concepts and processes, and explore the interrelationship among science, technology and society.
2. Providing school districts and science educators with a contemporary basis for the development of their own science programs and curricula.
3. Defining the core science knowledge and performances that are expected from all students and that will be assessed through statewide science assessments.

## Feedback Edition

It is hoped that, as a result of science education in Connecticut schools, all students will develop scientific literacy and will be able to:

- Understand and apply basic concepts, principles and theories of biology, chemistry, physics, and earth (including ecology) and space sciences and their interrelationships;
- Recognize and participate in scientific endeavors which are evidence-based, and use inquiry skills that lead to a greater understanding of the world;
- Identify and solve problems through scientific exploration, including the formulation of hypotheses, design of experiments, use of technology, analysis of data and drawing of conclusions;
- Select and properly use appropriate laboratory technology, equipment and materials, including measuring and sensing devices;
- Understand and use, when appropriate, existing and emerging technologies which have an effect on society and our quality of life, including personal, academic and work environments;
- Analyze the possibilities and limits of science and technology in order to make and defend decisions about societal issues; and
- Understand that the way in which scientific knowledge is formulated is crucial to the validity of that knowledge.

### **III. The Structure of the Science Framework**

The science framework describes an approach to science learning that starts with simple explorations of the natural world by elementary school students, moves into explorations and explanations of foundational science concepts in the middle school, and advances to explorations of science concepts and related global issues during the high school years. Schools will use the framework to develop their own science curriculum, including specific objectives, learning activities and assessments.

The Core Science Curriculum Framework is organized around *Content Standards* and *Expected Performances* for elementary grades (preK-2, 3, 4 & 5), middle grades (6, 7 & 8), and high school (9-10). *Content Standards* are broad statements of main science concepts; *Expected Performances* define the more specific knowledge or abilities that will enable students to build these understandings. The *Expected Performances* provide a “blueprint” for the knowledge and skills that will be measured on the statewide science assessments.

Each grade level includes content from the earth, life and physical sciences, with suggested explorations of science-related questions and issues. The main science concepts spiral through the grade clusters, each time treated with more depth and breadth, as developmentally appropriate for the students.

The intent of the framework is to describe a core body of science knowledge expected to be learned by all students, and assessed at elementary, middle and high school levels. Although the framework introduces concepts from the life, physical and earth sciences in each grade level, schools may choose to design yearly courses that focus on one science discipline at a time, allowing districts flexibility based on the needs of students and available instructional resources.

**"The important thing is not to stop questioning." (Albert Einstein)**