

State Board of Education Policy on the Teaching of Natural Sciences

2016 Science Framework FOR CALIFORNIA PUBLIC SCHOOLS Kindergarten Through Grade Twelve



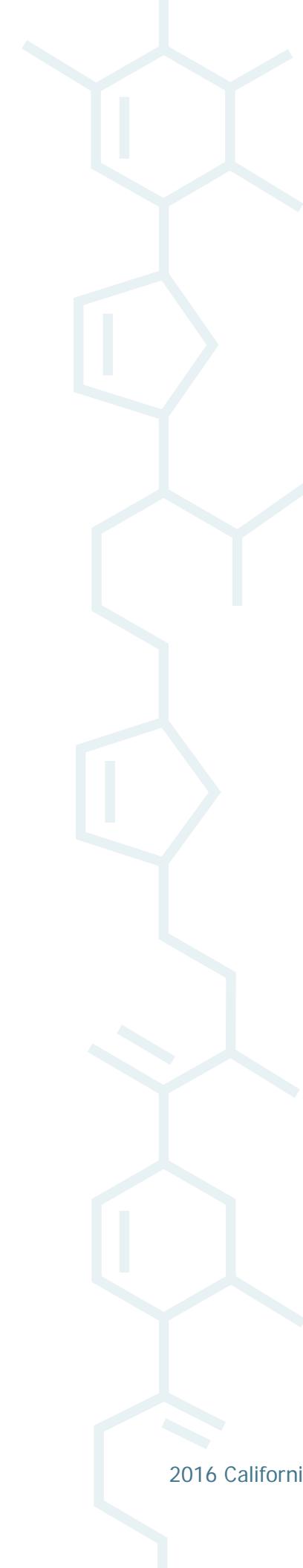
Adopted by the California State Board of Education
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To view the remaining sections of the 2016 California Science Framework on the CDE website, go to:
<https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.asp>

Items in this document that relate to crosscutting concepts are highlighted in green and followed by the abbreviation CCC in brackets, **[CCC]**, with a number corresponding to the concept. The same items that correspond to the science and engineering practices are highlighted in blue and followed by the abbreviation SEP in brackets, **[SEP]**, with a number corresponding to the practice.

The Web links in this document have been replaced with links that redirect the reader to a California Department of Education (CDE) Web page containing the actual Web addresses and short descriptions. Here the reader can access the Web page referenced in the text. This approach allows CDE to ensure the links remain current.



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The domain of the natural sciences is the natural world. Science is limited by its tools—observable facts and testable hypotheses.

Discussions of any scientific fact, hypothesis, or theory related to the origins of the universe, the Earth, and life (the how) are appropriate to the science curriculum. Discussions of divine creation, ultimate purposes, or ultimate causes (the why) are appropriate to the history–social science and English–language arts curricula.

Nothing in science or in any other field of knowledge shall be taught dogmatically. Dogma is a system of beliefs that is not subject to scientific test and refutation. Compelling belief is inconsistent with the goal of education; the goal is to encourage understanding.

To be fully informed citizens, students do not have to accept everything that is taught in the natural science curriculum, but they do have to understand the major strands of scientific thought, including its methods, facts, hypotheses, theories, and laws.

A scientific fact is an understanding based on confirmable observations and is subject to test and rejection. A scientific hypothesis is an attempt to frame a question as a testable proposition. A scientific theory is a logical construct based on facts and hypotheses that organizes and explains a range of natural phenomena. Scientific theories are constantly subject to testing, modification, and refutation as new evidence and new ideas emerge. Because scientific theories have predictive capabilities, they essentially guide further investigations.

From time to time natural science teachers are asked to teach content that does not meet the criteria of scientific fact, hypothesis, and theory as these terms are used in natural science and as defined in this policy. As a matter of principle, science teachers are professionally bound to limit their teaching to science and should resist pressure to do otherwise. Administrators should support teachers in this regard.

Philosophical and religious beliefs are based, at least in part, on faith and are not subject to scientific test and refutation. Such beliefs should be discussed in the social science and language arts curricula. The Board's

position has been stated in the *History–Social Science Framework* (adopted by the Board).¹ If a student should raise a question in a natural science class that the teacher determines is outside the domain of science, the teacher should treat the question with respect. The teacher should explain why the question is outside the domain of natural science and encourage the student to discuss the question further with his or her family and clergy.

Neither the California nor the United States Constitution requires that time be given in the curriculum to religious views in order to accommodate those who object to certain material presented or activities conducted in science classes. It may be unconstitutional to grant time for that reason.

Nothing in the California *Education Code* allows students (or their parents or guardians) to excuse their class attendance on the basis of disagreements with the curriculum, except as specified for (1) any class in which human reproductive organs and their functions and process are described, illustrated, or discussed; and (2) an education project involving the harmful or destructive use of animals. (See California *Education Code* Section 51550 and Chapter 2.3 of Part 19 commencing with Section 32255.) However, the United States Constitution guarantees the free exercise of religion, and local governing boards and school districts are encouraged to develop statements, such as this one on policy, that recognize and respect that freedom in the teaching of science. Ultimately, students should be made aware of the difference between understanding, which is the goal of education, and subscribing to ideas.

Note: This policy statement on the teaching of natural sciences, which was adopted by the State Board of Education in 1989, supersedes the State Board's 1972 Antidogmatism Policy.

1. *History–Social Science Framework for California Public Schools* (Updated edition with content standards). Sacramento: California Department of Education, 2001.