California Science Framework

2015 STEM Symposium
October 29, 2015

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Robert Foster, Science Subject Matter Committee Chair, Instructional Quality Commission

CALIFORNIA DEPARTMENT OF EDUCATION
Tom Torlakson, State Superintendent of Public Instruction
An Overview

- *Science Framework for California Public Schools Kindergarten Through Grade Twelve (Science Framework) Revision Process*
- Science Curriculum Framework and Evaluation Criteria Committee (CFCC)
- Science Framework Chapter Topics
- Snapshot Activity
- Middle Grade Progressions
- High School Progressions
- How to Get Involved
- Question and Answer Time
Science Framework Revision

- Guide the field in implementing the Next Generation Science Standards for California Public Schools, Kindergarten through Grade Twelve (CA NGSS)
- Provide guidance in implementing the Common Core State Standards for Literacy in Science
- Provide guidance on how to implement the three dimensions of NGSS: Science and Engineering Practices, Crosscutting Concepts, Disciplinary Core Ideas
- Provide guidance on the middle school and high school course models
- Provide evaluation criteria for instructional materials in science.
This chart shows the major steps of the curriculum framework development process.

All meetings are open to the public.
The Curriculum Framework and Evaluation Criteria Committee (CFCC)

- Members are recruited and recommended by the Instructional Quality Commission, and appointed by the SBE
- CFCCs have 9–20 members
  - A majority are credentialed K–12 teachers
  - At least 1 Content Review Expert
  - At least 1 experienced with English learners
  - At least 1 experienced with students with disabilities
Role of the Science CFCC

- Advises the Instructional Quality Commission and the SBE
- Develops a draft framework based on guidance from the IQC and the SBE
- Provides multiple opportunities for interested and concerned members of the public to submit written and oral comments throughout the framework development process
Curriculum Framework and Evaluation Criteria Committee

• Co-Chairs: Dr. Helen Quinn and Robert Sherriff
• Lead Writers: Maria C. Simani, Ph.D., Executive Director, California Science Project and J. Kirk Brown, Director, Delta Sierra Science Project
• Writers: California Science Project, WestEd, and K12 Alliance.
What Content is in the CA Science Framework?

- Introduction and Guiding Principles
- Overview
- Access and Equity
- Instructional Strategies
- Grade Level Chapters TK–2, 3–5, 6–8, and 9–12
- Assessment
- Implementing High Quality Science Instruction
- Instructional Materials to Support the CA NGSS (including the evaluation criteria for the adoption of instructional materials)
- Appendices
Lead Framework Writers

Dr. Maria C. Simani
Executive Director
California Science Project

J. Kirk Brown
Director, Delta Sierra Science Project
Director of Science and STEM Integration/Innovation
San Joaquin County Office of Education
Characteristics of Grade-level Sections

Grade-level Chapters Organization:
- Transitional Kindergarten
- Kindergarten through Grade Two
- Grades Three through Five
- Grades Six through Eight
- Grades Nine through Twelve
At Each Grade Level

- Example of unit sequence
- Review of core ideas (teacher background)
- Students’ pre-conceptions addressed
- Suggestions for integrating all three NGSS dimensions
Additional Features

- Snapshots and vignettes to demonstrate integration of 3-dimensional learning in the classroom
- Examples of different types of assessment
- Links to resources and Web sites for additional support
Snapshot Activity

- Please read the snapshot activity.
- Discuss the snapshot with your table or elbow partners.
- Answer these questions.
- Then I will take answers from the audience.

1. What is new? What is different?
2. What are the key shifts in instruction that occur in this vignette?
3. How is 3-dimensional learning exemplified?
Vignettes

- Longer than a snapshot
- They can cover numerous lessons over a span of time
- 3-dimensional learning
- Help show and support the connections to math, English language arts, and English language development.
# Unit At-A-Glance

**Example Grade K**

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<thead>
<tr>
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<tbody>
<tr>
<td>• Planning and carrying out investigations</td>
<td>• Stability and Change</td>
<td>K-PS2-1</td>
<td>PS2.A: forces and motion</td>
<td></td>
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<tr>
<td>• Analyzing and interpreting data</td>
<td>• Cause and Effect</td>
<td>K-PS2-2*</td>
<td>PS2.B: types of interactions</td>
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<tr>
<td>• Defining problems</td>
<td></td>
<td>K-2-ETS1-1</td>
<td>PS3.C: relationship between energy and forces</td>
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<tr>
<td>• Designing solutions</td>
<td></td>
<td></td>
<td>ETS1.A: defining and delimiting engineering problems</td>
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</table>

<table>
<thead>
<tr>
<th>Brief Summary</th>
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<tbody>
<tr>
<td>Pushing or pulling on an object can change its speed or direction of motion. An object in motion can be stopped or a non-moving object can start moving using pushes or pulls.</td>
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# Unit At-A-Glance Example Grade 5

## Grade 5–Unit 3: Earth Systems and Processes

- How much water can be found in different places on Earth?
- How does matter cycle through ecosystems?
- What can we do to protect earth’s resources?

### Crosscutting concepts:
- Scale, Proportion & Quantity; Systems & System Models; Cause and Effect

### Science and Engineering Practices:
- Obtaining, Evaluating and Communicating Information

5-ESS2-2, 5-ESS2-1, 5-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3.

With connections to math, ELA, ELD, and EPC.
Middle School (Grades 6–8)

- Preferred Integrated Model
  - Every discipline every year
- Discipline Specific Model
  - One discipline every year
High School Models

- 4-courses – discipline specific
- 3-courses – discipline specific with integrated Earth and Space Science
- 3-courses – coordinated integration
<table>
<thead>
<tr>
<th>Event Description</th>
<th>Dates</th>
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<tbody>
<tr>
<td><strong>First 60-day public review period</strong> prior to IQC recommendation to SBE, pursuant to 5 CCR, §9515(a)(3)</td>
<td>November 17, 2015 – January 19, 2016</td>
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<tr>
<td><strong>Science SMC analyzes</strong> public review results and staff recommendations for edits to draft Science Framework</td>
<td>February &amp; March 2016</td>
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<td><strong>IQC recommends</strong> draft Science Framework to the SBE.</td>
<td>May 19–20, 2016</td>
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<td><strong>Second 60-day public review</strong> and comment on IQC’s recommended Science Framework, pursuant to Section §95159(c)</td>
<td>June–July 2016</td>
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<td><strong>SBE action</strong> on IQC’s recommended Science Framework, includes public hearing.</td>
<td>September/November 2016</td>
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</table>
How to Get Involved

- All frameworks are released for 2 60-day public reviews
- The first 60-day public review begins on November 17, 2015
- http://www.cde.ca.gov/ci/sc/cf/
- scienceframework@cde.ca.gov
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Questions