



California's Next Generation Science Standards (CA NGSS) Assessment Plan

**State Board of Education
March 2016**

**Michelle Center, Director
Assessment Development and Administration**



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March SBE Meeting

- The SBE action today:
 - Approve grades for administration consistent with the assessment design plan
- Approval will allow us to prepare for the pilot testing in 2016-17.
- The assessment itself will change/improve over time.

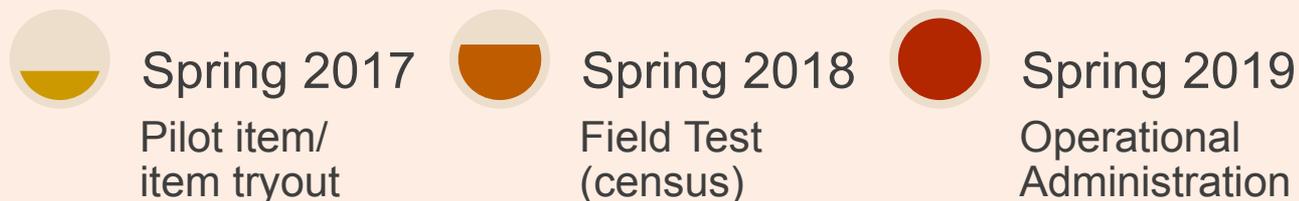


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Introduction CA NGSS Assessment Design and Implementation Plan

CA NGSS assessments are part of the CAASPP System.

The timeline for development of the new CA NGSS assessment is as follows:



Educational Testing Service (ETS) is the contractor charged with the design and development of the new CA NGSS-aligned assessment.



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Role of Educators and Other Stakeholders in CA NGSS Design Process

CA NGSS design was informed by feedback provided by:

<p>Hundreds of CA science teachers, including representatives of the California Science Teachers Association</p>	<p>Higher education officials, including representatives of Stanford University's Assessment Program (SNAP)</p>	<p>STEM reform experts, including representatives from NRC's <i>Framework for K-12 Science Education</i></p>	<p>Representatives from various other advocacy groups</p>



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Stakeholder Priorities for NGSS Assessments

- Focus on providing information to support the *improvement of teaching and learning*.
- Promote the dramatic shift in science instruction across all grades.
- Reflect fidelity to the NGSS.



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Design Team Members

- David Baum, Systems Analyst & Interoperability Specialist, ETS
- Dr. Katherine Castellano, Psychometrician, ETS
- Peter Chan, General Manager, Application Development, ETS
- Dr. Tim Davey, Psychometrician, ETS
- Dr. Janet Koster von Groos, Assessment Specialist, Physics, ETS
- Dr. Cara Laitusis, Director, Validity Research, ETS
- Cassandra Malcom, NGSS Program Manager, ETS
- Dr. James Pellegrino, Professor and Co-Director of the Learning Sciences Institute, University of Illinois, Chicago
- Dr. Kathleen Scalise, National Assessment of Educational Progress (NAEP) Science Director, ETS; Professor, University of Oregon
- Kit Viator, Executive Director, K-12 Assessment, ETS



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CA NGSS Assessment Design Goals

Goals for the design are to:

- Emphasize importance of group-level results to promote improvements to teaching and learning.
- Provide models of high quality, CA NGSS-aligned assessment items.
- Create incentives for schools to provide science instruction in every grade, not just in tested grades
- Measure the range and depth of NGSS performance expectations by leveraging the state's distinctly large student population.
- Minimize testing time and costs.



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CA NGSS Design Features

- Assessment design measures the range and depth of CA NGSS performance expectations (PEs) *over a three year cycle*.
- Assessment items, generated by evidence-centered design based task models, each integrate a *minimum of two* NGSS dimensions:
 - Disciplinary core ideas (DCIs)
 - Science and engineering practices (SEPs)
 - Crosscutting concepts (CCCs)
- Design makes use of a diverse range of item types.
- Both independent items as well as item sets are used.



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CA NGSS Design Features (*continued*)

- This is a two-stage adaptive assessment.
- Uses partial matrix sampling of content
 - Group level feedback while ensuring individual student performance is measured fairly and comparably
- Administered at grades five, eight and grade ten, eleven, or twelve.
- The assessment is designed to be administered in two hours or less.



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Summative Segment A

The design requires that all students in the tested grades (5, 8, and 10, 11 or 12) participate in *three segments* of the test:

- **Segment A** is a two-stage adaptive segment
 - Machine-scorable short answer and selected response items that cover a very *broad* range of the CA NGSS PEs
 - Contributes to student and group scores



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Transition from Segment A to Segment B

- Performance in **Segment A** guides selection of DCIs presented in **Segment B**.
- The assignment of the item content (DCIs) in **Segment B** will be random unless DCI performance in **Segment A** is particularly weak.



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Summative Segment B

- **Segment B** includes item *sets* which require students to solve a series of complex problems set in *discipline-specific* contexts which deeply measure a student's command of selected CA NGSS PEs.
 - Contributes to student and group scores.



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Summative Segment C

- **Segment C** includes a range of items that, collectively, broadly and deeply measure the CA NGSS PEs associated with the tested *grade-span*.
 - All CA NGSS PEs (minus those identified as not suitable for summative assessments) will be *collectively* assessed at the group-level.
 - Encourages the teaching of science at all grade levels
 - Contributes to group-level scores.



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Design Summary

	Segment A	Segment B	Segment C
Reporting Level	Contributes to <i>Student</i> and <i>Group Score</i>	Contributes to <i>Student</i> and <i>Group Score</i>	Contributes to <i>Group Score</i>
Scope and Depth of Measurement	Wide breadth—measures a broad sample of CA NGSS PEs	Deep measurement of targeted sample of 1-2 item sets (multiple CA NGSS SEPs and CCCs per item set, and one or more DCIs per item set as specified by task models)	Broad and deep-full range of measurement of PEs for each grade span
Type of Items	Selected-response, machine-scorable items. Items primarily independent but some organized in sets.	Item sets which require students to solve a series of complex problems set in discipline-specific contexts.	Will emulate item types presented in Segment A or B.
CA NGSS PEs measured by grade/grade span	Gr. 5: Grade 5-specific PEs Gr. 8: Grade-span PEs Gr. 10/11/12: Grade-span PEs	Gr. 5: Grade 5-specific PEs Gr. 8: Grade-span PEs Gr. 10/11/12: Grade-span PEs	Gr. 5: Grade-span PEs Gr. 8: Grade-span PEs Gr. 10/11/12: Grade-span PEs