

The background of the slide is the Seal of the State of California. It features a central figure, Minerva, seated and holding a spear. She is wearing a blue dress and a red shawl. In front of her is a grizzly bear. To the left, a miner is shown working in a field. In the background, there are mountains, a bay with several sailing ships, and a small boat. The seal is encircled by the text "THE GREAT STATE OF CALIFORNIA" and "EUREKA" at the top.

# Next Generation Science Standards Systems Implementation Plan for California

**July 2014**

California Department of Education

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## CA Next Generation Science Standards Systems Implementation Timeline & Key Events

Years					
2013	2014	2015	2016	2017	2018
September 4, 2013 California SBE Adopts Next Generation Science Standards	January – February 2014 NGSS Framework Focus Groups and Public Comment		March – 2016 Anticipated CDE Recommendations to the SBE on Science Assessments	Anticipated List of SBE-Adopted K-8 Science Instructional Materials Adoption	
November 6, 2013 California SBE Adopts Preferred Integrated Model for Grades 6-8 and Authorizes Discipline Specific Model as Alternative Model for Grades 6-8	March – May, 2014 Strategic Leadership Team (SLT) develops Science Education Strategic Plan (SESP)				
	April – June 2014 Spring NGSS Leadership Rollout				
	July 2014 Science Assessment Stakeholder Meetings Begin				
	2014 – 2016 Revision of Science Framework	2014 – 2016 Revision of Science Framework	2014 – 2016 Revision of Science Framework		
	2014 -- 2018 CA NGSS Early Adopters Network	2014 -- 2018 CA NGSS Early Adopters Network	2014 -- 2018 CA NGSS Early Adopters Network	2014 -- 2018 CA NGSS Early Adopters Network	2014 -- 2018 CA NGSS Early Adopters Network
		2015 – 2018 Anticipated Implementation of CA NGSS in California Schools	2015 – 2018 Anticipated Implementation of CA NGSS in California Schools	2015 – 2018 Anticipated Implementation of CA NGSS in California Schools	2015 – 2018 Anticipated Implementation of CA NGSS in California Schools

## INTRODUCTION

### California Department of Education Mission Statement

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*California will provide a world-class education for all students, from early childhood to adulthood. The California Department of Education serves our state by innovating and collaborating with educators, schools, parents, and community partners. Together, as a team, we prepare students to live, work, and thrive in a highly connected world.*

The California Department of Education (CDE) oversees the state's diverse and dynamic public school system, which is responsible for the education of more than six million children and young adults in more than 10,000 schools. The CDE and the State Superintendent of Public Instruction (SSPI) are responsible for enforcing education law and regulations; and for continuing to reform and improve public elementary school programs, secondary school programs, adult education, some preschool and child care programs.

### Background Information

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Senate Bill 300 [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201120120SB300&search\\_keywords=](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB300&search_keywords=) Chaptered in 2011, required SSPI Tom Torlakson to present new science standards, based on the Next Generation Science Standards (NGSS), to the California SBE, by July 31, 2013. The SBE had until November 30, 2013, to adopt, modify, or reject the proposed standards.

In September 2011, California became one of 26 lead states in the development of the NGSS based on the National Research Council's (NRC) *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (Framework)*. Achieve, Inc., an independent, bipartisan, non-profit organization based in Washington, D.C., facilitated the national process. The NRC vision for science education, presented in the framework, states that by the end of 12th grade all students should: have some appreciation of the beauty and wonder of science; possess sufficient knowledge of science and engineering to engage in public discussions on related issues; be careful consumers of scientific and technological information related to their everyday lives; be able to continue to learn about science outside school; and have the skills to enter careers of their choice, including (but not limited to) careers in science, engineering, and technology. [adapted from *A Framework for K-12 Science Education*, (2012), p1]. To reach this vision the NGSS identifies a three-dimensional approach to understanding science and engineering 1) Scientific and Engineering Practices, 2) Crosscutting Concepts, and 3) Disciplinary Core Ideas.

In November 2011, SSPI Torlakson convened a State Review Team (SRT) consisting of 80 science experts representing kindergarten through grade twelve (K–12) science teachers, administrators, county science consultants, college and university professors, scientists, science informal centers, and business and industry. Over a span of nearly 18 months, the SRT provided public comment and reviewed many drafts of the NGSS to provide feedback to Achieve, Inc. and the CDE.

In April 2013, after the final draft of the NGSS was released, SSPI Torlakson convened a Science Expert Panel (SEP), a smaller group representative of the SRT and noted scientists, Dr. Helen Quinn, Dr. Bruce Alberts, and Dr. Art Sussman. The SEP met three times from April to June 2013, to review feedback from three regional public meetings and SRT surveys, and to make final recommendations for the California standards based on the NGSS to the SSPI.

On September 4, 2013 (<http://www.cde.ca.gov/be/mt/ms/index.asp>), the SBE voted unanimously to adopt the *Next Generation Science Standards for California Public Schools, Kindergarten through Grade Twelve* (CA NGSS) (<http://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp>) as required by the California *Education Code* Section 60605.85. The NGSS Appendices A-M was also adopted to assist educators in the implementation of the new science standards. On November 6, 2013 (<http://www.cde.ca.gov/be/mt/ms/index.asp>), the SBE voted unanimously to adopt the California Integrated Model (<http://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp>) as the preferred model for middle grades, but allowed an alternative discipline specific model for grades six through eight (6–8) based upon the discipline specific model outlined by Achieve in the NGSS Appendix K as an alternative model (<http://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp>).

## The Purpose of This Document

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The CA NGSS have the potential to transform science education in California (as well as the rest of the nation) requiring a different way of thinking about teaching and learning. What differentiates the CA NGSS from past California science standards is the way the CA NGSS weave together the three dimensions (scientific and engineering practices, disciplinary core ideas, and crosscutting concepts) of the *Framework* across the NGSS scientific disciplines (physical science, life science, earth and space science), and engineering, technology, and practical applications of science. The CA NGSS focuses on knowledge in use in the form of performance expectations, which correlate and align to the adopted *Common Core State Standards (CCSS)* in English Language Arts and Mathematics.

The CA NGSS performance expectations require students to demonstrate their understanding of scientific and engineering practices, disciplinary core ideas, and crosscutting concepts through the application of science and

engineering. The performance expectations also provide a context for learning science and include how scientific knowledge is acquired and how the disciplines of science are connected.

The standards do not prescribe a curriculum nor determine instructional strategies; rather they are intended to guide the development of all of these materials.

*The Next Generation Science Standards Systems Implementation Plan for California (Plan)*, <http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp>, assists the CDE, the Local Educational Agencies (LEAs), and Support Providers to collaboratively actualize the CA NGSS in educational systems for every student. The *Plan* identifies eight strategies and accompanying activities/indicators for the implementation of the CA NGSS.

Many of the recommendations in this document will require additional resources, funding, and/or policy change in order to implement. These items will be identified with an asterisk ( \* ).

## Program Element Matrix

The *Plan* is presented in a **Program Elements Matrix (PEM)** format, which identifies important elements for each strategy and describes a continuum of activities/indicators for each element across the three implementation phases (awareness, transition, and implementation). Each of the eight strategies is independently detailed, yet, when viewed as a whole, the strategies are interwoven and work synergistically to provide a comprehensive and coherent plan.

While the *Plan* provides a pathway for activities related to implementation, this document is not designed to be an action plan nor an exhaustive task list. Neither is its purpose to identify or discuss the specifics of the standards themselves—many other resources produced by the CDE and its collaborative partners provide reviews and analyses of the CA NGSS.

The CDE, LEAs, and Support Providers should use this plan to develop specific NGSS implementation action plans in order to meet local needs. The CDE, LEAs, and the Support Providers will find the information in the PEMs useful as an outline for statewide alignment and implementation of the CA NGSS. The *Plan* also includes information on many specific resources they may wish to utilize and implementation activities in which they may choose to participate. The *Plan* assumes that the strongest form of implementation involves the on-going partnership of the CDE, the LEAs, and the Support Providers with each other and with their diverse stakeholders.

## Phases of Implementation

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Implementation of CA NGSS systems will occur over several years and in the context of a continuous learning process. Accordingly, the *Plan* exists within phases of the change process. The phases are straightforward, yet lightly defined, because for each program and project there exists an ongoing development and progression that must evolve both at the individual elemental level and the integrated systems level

- ❖ The **awareness phase** represents an introduction to the CA NGSS, the initial planning of systems implementation, and establishment of collaborations.
- ❖ The **transition phase** is the concentration on building foundational resources, implementing needs assessments, establishing new professional learning opportunities, and expanding collaborations between all stakeholders.
- ❖ The **implementation phase** expands the new professional learning support, fully aligns curriculum, instruction, and assessments, and effectively integrates these elements across the field.

## California's Diverse Stakeholders

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A systems approach to implementing the CA NGSS provides coherence and necessitates extensive communication and collaboration among all of California's educational stakeholders. The CDE is working diligently to ensure clear communications and expectations, and this document is an important component of this goal. Yet, without the engagement and assistance of all educational stakeholders, the CDE cannot successfully oversee the implementation of the CA NGSS. The role of each stakeholder group in contributing to the implementation is vitally important to the success of the plan.

The CA NGSS were created by representative groups of teachers, administrators, parents, content experts, support providers, and education professionals, each bringing a unique educational perspective into the development. For the implementation of the CA NGSS to be successful, it will take a vast majority of all members of these groups working to achieve the common goals.

The *Plan* addresses three groups the CDE, the LEAs, and Support Providers. CDE includes the California Department of Education and the State Board of Education. Local Educational Agencies (LEAs) include districts, schools, and county

offices of education. Support providers include, but are not limited to: business and industry, county offices of education, institutions of higher education, parent groups, professional learning providers, professional organizations, public media providers, science centers and museums, science informal education providers, and nonprofit organizations. The CDE is responsible for integration of the CA NGSS into the statewide educational system. It implements the law established by state and federal elected officials through administration of statewide programs. State and federal elected officials can support implementation by creating and opening doors for opportunity.

Working with state officials and local districts, institutions of higher education can seek to cultivate student college readiness, and in working with the Commission on Teacher Credentialing, can ensure high quality teacher preparation. But beyond these governmental groups, a wide array of community partners can seek to support educators in many ways. Professional organizations, including support providers and those representing educators, are a key component in providing information, feedback, and support throughout the implementation process. This document not only charts the path for CA NGSS systems implementation but illuminates opportunities for extensive involvement.

LEAs are the entities responsible for the integration of the CA NGSS into curriculum, instruction, and professional learning. Teachers are the front line in implementing the CA NGSS. School site administrators provide teachers with instructional leadership and maintain a safe learning environment for both students and teachers. District administrations and elected boards can establish policies designed to facilitate state and federal programs and empower teachers and site administrators with local creativity and flexibility. County offices of education and other support providers can provide technical assistance and professional learning support at the regional level for the schools and districts they serve.

The role of the families, parents, and guardians is all encompassing. Involvement at every level of their student's education is fundamental for a student's personal success. Families, parents, and guardians can ensure that students arrive at school ready to learn, provide quiet time and space at home for students to study, and stay involved in students' learning through positive engagement about their academic work and social interactions. Additionally, there are many opportunities for involvement at the school site, providing support for administrators, teachers, and the students.

Of all stakeholders, students are perhaps the most ready to implement the new standards. Offered engaging content by well-prepared teachers using effective strategies, students will respond with determined interest and perform to their best ability. The role of every other stakeholder group is to ensure that the students—all students—gain meaningful access to the content and that all necessary support systems are in place.

Support providers such as county offices of education, professional development providers, state parent groups, state afterschool and early childhood provide links between the CDE and the LEAs implementing the Ca NGSS. Support provider roles offer a systems approach to professional learning for all stakeholders.

In reviewing this document, stakeholders should note instances for potential involvement. For various groups, these opportunities may be different. Teachers and administrators may wish to participate in professional learning opportunities. Families may wish to view CDE-sponsored webinars or review available publications. In many cases, the opportunity for stakeholder input will be more open-ended. For example, the SBE invites public comment on meeting agenda items. In other instances, the CDE will seek stakeholder feedback on particular issues. Involvement may be as easy as subscribing to a listserv for information on a particular topic. Opportunities abound, and the CDE and SBE welcome and encourage participation.

## Guiding Strategies

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The *Plan* is grounded in eight guiding strategies for implementation. These strategies encompass all areas of our educational system, and while they provide focus to the work, they also reveal its highly integrated nature. The eight guiding strategies for the CA NGSS systems implementation are:

1. Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.
2. Provide CA NGSS-aligned instructional resources designed to meet the diverse needs of all students.
3. Develop and transition to CA NGSS-aligned assessment systems to inform instruction, establish priorities for professional learning, and provide tools for accountability.
4. Collaborate with parents, guardians, and the early childhood and expanded learning communities to integrate the CA NGSS into programs and activities beyond the K–12 school setting.
5. Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.
6. Seek, create, and disseminate resources to support stakeholders as the CA NGSS systems implementation moves forward.
7. Design and establish systems of effective communication among stakeholders to continuously identify areas of need and disseminate information.
8. Build coalitions to ensure a common message and to sustain momentum during implementation.

## Process for Development of the Plan

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The CDE convened representatives from critical science stakeholder organizations (e.g., K–12 teachers, administrators, college and university faculty, parent groups, business and industry, county offices of education, professional learning providers, public media providers, science informals, and professional organizations) to collaborate on the development of this plan. Over three months, the Science Leadership Team (SLT) identified the important elements of each strategy, developed activities/indicators for each stakeholder and phase, sought input from their constituents at each step of the process, and revised and refined the plan based on the feedback. CDE then asked its different program offices to review the plan and provide comments. The plan was released for a 30-day public comment period beginning July 25, 2014 and was presented for information before the State Board of Education (SBE) in September. Relying on public comment and input from the SBE and CDE leadership, the plan will be revised in October and presented to the SBE for action in November 2014.

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## Introduction for Strategy 1: Professional Learning

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***Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.***

Successful enactment of this strategy requires a collaborative partnership of the CDE, LEAs, and professional learning support providers including, but not limited to: county offices of education, professional learning providers, institutions of higher education, science centers and museums, science informal education providers, and professional organizations.

This strategy incorporates many of the shifts in instructional practice required by the CA NGSS. This includes professional development incorporating three-dimensional (3D) teaching and learning (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts); science for all students; and connections to other applicable CA state standards relevant to each topic and grade span. The shifts require a systems approach to science education, supported by policies, programs, personnel, and resources.

The Program Elements Matrix for Strategy 1 is organized into the following seven elements:

- 1. Policy and Legislation/Procedures.** This element provides support in the establishment and translation of policies and legislation at the state level to practices and procedures at the local levels. This element outlines funding opportunities including the allocation of resources to support high quality NGSS implementation. The element also identifies policies to recognize high quality programs for schools and teachers' professional learning.
- 2. Leadership Collaborative.** This element creates state, regional, local, and expanded learning leadership collaboratives of professional learning stakeholders to share and learn from each other throughout the implementation of the CA NGSS. The element includes the development of working groups that will provide timely feedback to improve professional learning as needs change through the implementation and beyond.
- 3. Teacher Leadership Academies.** This element provides guidance for the formation of academy programs that develop science teacher leadership capacity throughout the state. Identification of teacher leaders is outlined along with mechanisms to support their leadership growth at the local levels.
- 4. Administrator Professional Learning.** This element focuses on the development and implementation of programs to support administrators as they lead their sites towards CA NGSS implementation. Administrators learn

how to identify CA NGSS best practices, learn from and visit model programs, and provide opportunities to collaborate with teachers as well as mentor them.

5. **Early Adopter Districts Network.** This element outlines the identification of districts and sites that are early implementers of CA NGSS and provides ways for them to share examples of their best CA NGSS practices throughout the implementation process. Readiness indicators will be used to identify the best practices of classrooms, schools, and districts.
6. **Resources for Teacher/Administrator Professional Learning.** This element is intended to guide stakeholders in developing, evaluating, and, ultimately selecting professional learning experiences. In addition, this element responds to the changing needs of stakeholders throughout CA NGSS implementation. LEAs and support providers utilize the CDE initiated or created resources and add resources to meet their needs. This element is expanded at the LEA and support provider level to include an additional element: Teacher Professional Learning Element. This element addresses the needs of teachers as individuals and collaborators in school and district based communities of practice.
7. **Teacher Professional Learning.** This element describes the work that LEAs and support providers can individually and collaboratively accomplish to develop programs which meet local needs. Support providers, such as informal science centers (museums, aquariums, zoos, and national labs), county offices of education, K–12 Alliance/WestEd, California Science Project (CSP), California Science Teachers Associations (CSTA), language development experts, and others provide training opportunities that support CA NGSS professional learning. In addition, this element outlines a strategy for collaboration between support providers.

## Strategy 1

### California Department of Education Implementation Plan for the NGSS

Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>POLICY AND LEGISLATION</b>	*The CDE researches funding opportunities for implementation of CA NGSS including professional learning for teachers and administrators.	*The CDE accesses available funding for implementation of CA NGSS including professional learning for teachers and administrators.	*The CDE provides formal communications about professional learning programs for teachers and administrators funded by the CA NGSS appropriations.
	The CDE develops a method/rubric for determining quality science programs and instruction.	The CDE invites applicants and evaluates their science programs and practices using previously developed method/rubric.	The CDE recognizes exemplary science programs and instruction at appropriate events and shares best practices statewide.
<b>STATE LEADERSHIP COLLABORATIVE</b>	*The CDE, in partnership with other science professional learning programs, organizations, and stakeholders, identifies and convenes a state leadership collaborative of science education leaders to better understand CA NGSS and strategize implementation practices.	*The CDE, with the state leadership collaborative, adds essential stakeholders and policy makers to share ideas and resources for CA NGSS implementation and to form ad hoc committees to identify and address specific needs.	*The CDE convenes and facilitates collaborative meetings on a bi-annual basis or as needed for the CA NGSS post-implementation.
<b>STATE TEACHER LEADERSHIP ACADEMIES</b>	*CDE, as a member of a state leadership collaborative, participates in developing a plan and seeking funding for a statewide teacher leadership academy that builds on existing leadership opportunities.	*CDE, as a member of a state leadership collaborative, helps to implement statewide teacher leadership academy.	*CDE, as a member of a state leadership collaborative, helps to evaluate and continue statewide teacher leadership academy, and distributes a list of teacher leaders as a resource to others.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	The CDE, as a member of a state leadership collaborative, disseminates information about opportunities for teachers to participate in state level activities and professional learning opportunities.	The CDE, as a member of a state leadership collaborative, encourages and supports teacher participation in state level activities and professional learning opportunities.	The CDE, as a member of the a state leadership collaborative, provides expanded opportunities for teachers to participate at state level activities and professional learning opportunities.
<b>ADMINISTRATOR PROFESSIONAL LEARNING</b>	*The CDE, in collaboration with the Association of California School Administrators (ACSA) and the CA School Board Association (CSBA), develops/provides local and regional workshops on CA NGSS and supporting resources.	*The CDE, in collaboration with the ACSA and the CSBA, develops guidelines for science classroom observations and tools for evaluation of science teaching.	*The CDE, in collaboration with the ACSA and the CSBA, develops indicators for an evaluation tool for science instructional practices.
	*The CDE develops a Request for Application (RFA) and contracts with stakeholders to produce an administrator Professional Learning Module (PLM) including guidance through the phases (awareness, transition and implementation) and examples of best practices.	*The CDE works with approved contractors to develop and disseminate the PLM.	*The CDE, in collaboration with stakeholders, develops and implements, administrator training that addresses coaching science teachers toward more effective science teaching that is accessible to all students, including English Learners.
<b>RESOURCES FOR TEACHER/ ADMINSTRATOR PROFESSIONAL LEARNING</b>	*The CDE participates with other professional learning stakeholder organizations to convene CA NGSS awareness roll-out workshops	*The CDE participates with other professional learning stakeholder organizations to convene CA NGSS transition roll-out workshops for local	*The CDE participates with other professional learning stakeholder organizations to convene CA NGSS implementation roll-out

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	for local teams of teachers and administrators.	teams of teachers and administrators.	workshops for local teams of teachers and administrators.
	*The CDE, in collaboration with professional learning stakeholder organizations, researches and develops an NGSS digital center for teachers to access professional learning materials with links to Achieve and other NGSS adopted states.	* CDE, in collaboration with professional learning stakeholders, refines and focuses the NGSS digital center based on feedback from users.	*The CDE collaborates with professional learning stakeholders to support the development of future digitally-based NGSS professional learning resources.
	*The CDE ascertains the teacher professional learning needs for CA NGSS and creates a Request for Applications (RFA) for development of PLMs to address topics such as: elementary, middle (integrated), and high school science, links with CCSS and CA ELD Standards, and examples of best practices of 3-D teaching and learning presented in the CA NGSS.	*The CDE works with the approved contractors to develop and refine the PLMs.	* CDE and professional learning stakeholder organizations disseminate information about and provide workshops on use of PLMs.

## Strategy 1

### Suggestions and Opportunities for LEAs

Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>POLICY AND PROCEDURES</b>	The LEA tracks upcoming relevant legislation and shares with district and school leaders.	The LEA follows and appropriately responds to legislation that could impact science education.	The LEA evaluates action and refines strategies for addressing future legislation.
	The LEA observes for national, state, and local opportunities for evaluation and recognition of exemplary science education programs and practices	The LEA applies for appropriate recognition.	The LEA spotlights science success stories and shares best practices
	The LEA develops a district science professional learning plan for all administrators and teachers.	The LEA implements the science professional learning plan.	The LEA supports, evaluates, and refines the science professional learning plan.
	The LEA explores school schedule to allow for collaborative planning for purpose of improved science instructional practices.	The LEA initiates collaborative planning time devoted to the CA NGSS implementation.	The LEA evaluates the effectiveness of CA NGSS collaborative planning and makes revisions as necessary.
<b>LOCAL/REGIONAL LEADERSHIP COLLABORATIVE</b>	The LEA invites participation from all local and/or regional stakeholders to join a regional collaborative to support CA NGSS implementation.	The regional collaborative establishes a meeting schedule to share strategies and challenges.	The regional collaborative disseminates information about best practices and invites members to provide information on successful strategies for addressing challenges.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>TEACHER LEADERSHIP ACADEMIES</b>	The LEA nominates teachers to participate in the state/regional leadership academies.	The LEA assembles a science leadership team to design a local teacher leadership academy.	The LEA supports teacher leaders to provide professional learning for district teachers.
	The LEA encourages teachers and administrators to participate in the leadership conferences and workshops.	The LEA provides opportunities for teachers and administrators to provide professional learning to address identified CA NGSS district needs.	The LEA looks for and develops additional teacher leaders to provide expanded professional learning opportunities.
	The LEA disseminates information about opportunities for teachers to attend national, state and local professional learning opportunities.	The LEA encourages and supports teachers to participate in national, state, and local professional learning activities.	The LEA provides opportunities for participants to share with other teachers and administrators in their districts.
<b>ADMINISTRATOR PROFESSIONAL LEARNING</b>	The LEA provides opportunities for administrators to observe CA NGSS science instruction and research available guidelines and coaching tools.	The LEA administrators develop guidelines and coaching tools for classroom CA NGSS instruction, based on observations and research.	The LEA uses these guidelines and tools to evaluate science instructional practices.
	The LEA provides professional learning to administrators about the necessary shifts in curriculum and instruction to implement CA NGSS.	The LEA uses the CDE administrator PLMs as part of its administrative science professional learning.	The LEA administrators use exemplars of best practices from PLMs and Early Adopter District Network to inform district/school professional learning.
	The LEA researches funding opportunities to support professional learning for CA NGSS.	The LEA applies for funding opportunities to support professional learning for CA NGSS.	With awarded funding, the LEA implements initiatives to provide professional learning opportunities for CA NGSS.
	The LEA assists administrators	The LEA administrators use	The LEA administrators

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	in developing surveys to determine the science professional learning needs of their staff.	survey data to write and implement site professional learning plans.	evaluate and revise site professional learning plans.
	The LEA administrators identify community members who are interested in CA NGSS and who might form partnerships for science professional learning.	The LEA administrators provide professional learning to community partners about CA NGSS and support needs.	The LEA administrators identify opportunities for community involvement in CA NGSS professional learning and support ongoing partnerships.
<b>MODEL IMPLEMENTATION</b>	The LEA identifies promising NGSS programs and practices.	The LEA selects best practices and programs to serve as models for the district.	The LEA disseminates information about model programs, provides workshops on these models, and practices and invites district teachers to observe each other.
<b>RESOURCES FOR TEACHER/ ADMINISTRATOR PROFESSIONAL LEARNING</b>	The LEA provides opportunities for teachers and administrators to attend state CA NGSS awareness roll-out workshops.	The LEA provides opportunities for teachers and administrators to attend state CA NGSS transition roll-out workshops.	The LEA provides opportunities for teachers and administrators to attend state CA NGSS implementation roll-out workshops.
	The LEA provides information about of the NGSS digital center.	The LEA uses resources from the NGSS digital center to design and deliver local professional learning.	The LEA provides resources to the NGSS digital center.
	The LEA researches and employs existing resources to address teachers' professional learning needs. These should include strategies to ensure access for all students. For example, resources with	The LEA uses the identified resources, including the PLMs, as resources for teachers' professional learning.	The LEA evaluates the resources and PLMs and determines future professional development resource needs.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	<p>examples of instruction for ELs specifically related to Science can be found on the Brokers of Expertise site at <a href="http://www.myboe.org/">http://www.myboe.org/</a> in the CCSS English Language Development Professional Learning Modules (PLMs).</p> <p>The LEA provides awareness workshops to LEA Leadership Team on the Superintendent's Quality Professional Learning Standards (SQPLS).</p>	<p>The LEA uses SQPLS with science examples to guide selection of professional learning providers and services.</p>	<p>The LEA evaluates providers and services based on the SQPLS.</p>
<b>TEACHER PROFESSIONAL LEARNING</b>	<p>The LEA surveys teachers to determine their CA NGSS professional learning needs.</p>	<p>The LEA works with teachers to develop individual learning plans (ILPs) for CA NGSS professional learning.</p>	<p>The LEA supports, and revises as needed, teachers' ILPs for CA NGSS professional learning.</p>
	<p>The LEA, in collaboration with teachers, offers awareness professional learning sessions for all teachers.</p>	<p>The LEA, in collaboration with teachers, offers transition professional learning sessions for all teachers.</p>	<p>The LEA, in collaboration with teachers, offers implementation professional learning sessions for all teachers.</p>

## Strategy 1

### Suggestions and Opportunities for Support Providers

Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>PRACTICES AND PROCEDURES</b>	Professional learning support providers identify LEA content and resource needs.	Professional learning support providers provide technical assistance to LEAs based on identified CA NGSS content and resource needs.	Professional learning support providers evaluate and revise technical assistance to LEAs.
	Professional learning support providers, as members of state and regional collaboratives, provide feedback to LEAs and CDE about CA NGSS professional development best practices and policies.	Professional learning support providers, utilizing the state and regional collaboratives, act as a feedback conduit between the LEA and the CDE to inform policy about the CA NGSS transition phase.	Professional learning support providers, utilizing the state and regional collaborative, act as a feedback conduit between the LEA and the CDE to inform policy about the CA NGSS implementation phase.
<b>STATE/LOCAL/REGIONAL COLLABORATIVES</b>	Professional learning support providers participate in the Professional Learning Collaborative for the CA NGSS implementation.	Professional learning support providers lead or contribute to workings groups and ad hoc committees of the Professional Learning Collaborative for the CA NGSS implementation.	Professional learning support providers participate in the Professional Learning Collaborative for the CA NGSS implementation and beyond.
	Professional learning support providers help convene or contribute to the collaborative for the LEAs in their region.	Professional learning support providers contribute to the LEAs' regional collaborative regarding transition strategies.	Professional learning support providers contribute to the LEAs' regional collaborative regarding implementation

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	Professional learning support providers collaboratively convene to design a CA NGSS professional learning opportunities for other professional learning providers (e.g., museum staff, small professional learning providers, etc.).	Professional learning support providers collaboratively deliver the CA NGSS professional learning opportunities for other professional learning providers.	strategies. Professional learning support providers collaboratively evaluate the CA NGSS professional learning opportunities and engage in re-design for improvement and seek out new professional learning providers to engage in the process.
<b>TEACHER LEADERSHIP ACADEMIES</b>	Professional learning support providers develop and facilitate the CA NGSS awareness workshops and invite teacher leaders to co-present.	Professional learning support providers develop and facilitate the CA NGSS transition workshops and invite teacher leaders to co-present.	Professional learning support providers develop and facilitate the CA NGSS implementation workshops and invite teacher leaders to co-present.
	The professional learning support providers collaborate to recommend teachers for statewide teacher leadership academy.	The professional learning support providers mentor teacher leaders within their organization and provide opportunities for teacher leaders to share what they are learning at the statewide teacher leadership academy.	The professional learning support providers incorporate teacher leaders into their programs, support them in their work, and help to identify new teacher leaders for the statewide teacher leadership academy.
	Professional learning support providers collaborate to identify teacher leaders for regional teacher leadership academies.	Professional learning support providers support teacher leaders from the regional teacher leadership academies as they work at their school and/or district site.	Professional learning support providers incorporate teacher leaders into their programs, support them in regional work, and help to identify new teacher leaders for regional teacher leadership academies.
<b>ADMINISTRATOR</b>	Professional learning support providers develop and	Professional learning support providers and administrators	Professional learning support providers and administrators

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>PROFESSIONAL LEARNING</b>	facilitate the administrator strand of the CA NGSS awareness roll-out workshops.	co-develop and co-present in the administrator strand of the CA NGSS transition roll-out workshops.	co-develop and co-present in the administrator strand of the CA NGSS implementation roll-out workshops.
	Professional learning support providers collaborate with the LEA to develop and provide professional learning for administrators aligned to: <ul style="list-style-type: none"> <li>• CA NGSS awareness</li> <li>• Policy considerations</li> <li>• Site implementation plan</li> </ul>	Professional learning support providers collaborate with the LEA to develop and provide professional learning for administrators aligned to: <ul style="list-style-type: none"> <li>• CA NGSS transition</li> <li>• Policy considerations</li> <li>• Site implementation plan</li> </ul>	Professional learning support providers collaborate with the LEA to develop and provide professional learning for administrators aligned to: <ul style="list-style-type: none"> <li>• CA NGSS implementation</li> <li>• Policy considerations</li> <li>• Site implementation plan</li> </ul>
<b>MODEL IMPLEMENTATION</b>	Professional learning support providers work together to develop and disseminate indicators of the best CA NGSS practices.	Professional learning support providers use indicators to identify model programs within their organization and collaborate to publicize on the digital center.	Professional learning support providers invite model programs to disseminate best practices through local/regional/state venues.
<b>EARLY ADOPTER DISTRICTS NETWORK</b>	WestEd, CSP, COE, CSTA, and ACSA develop readiness indicators to identify districts as early CA NGSS adopters. The CDE and SBE provide support as requested.	WestEd, CSP, COE, CSTA, and ACSA select districts. Once selected they convene districts to share learning and identify promising practices.	WestEd, CSP, COE, CSTA, and ACSA evaluate the quality of the CA NGSS implementation in network districts and disseminate findings to other districts.
	WestEd's K-12 Alliance develops and acquires philanthropic support for a CA kindergarten through grade eight (K-8) CA NGSS Early Implementation Initiative for a small number of districts and charter networks, with geographic and LEA size	The Initiative is launched in August of 2014 as a four year demonstration pilot. The participating districts and charter management organizations receive intensive PD over four years, serve as a lab to beta-test CA NGSS aligned tools and	The CDE and SBE follow the progress of the Initiative and help to share findings and resources.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	diversity.	processes, and form a CA NGSS Early Implementers Collaborative to share learning and challenges.	
<b>RESOURCES FOR TEACHER PROFESSIONAL LEARNING</b>	Professional learning support providers disseminate information and how to access the NGSS digital center.	Professional learning support providers work with LEAs to provide resources for the NGSS digital center and show how to use resources.	Professional learning support providers help teachers/users evaluate and modify resources and encourage teachers to add resources.
	Professional learning support providers provide information to stakeholders about professional learning opportunities.	Professional learning support providers work with LEAs and stakeholders to provide professional learning opportunities that are aligned to teachers' Individual Learning Plans (ILPs) including the use of PLMs.	Professional learning support providers develop and deliver professional learning in response to the changing needs of stakeholders.
	Professional learning support providers collaborate to design and share professional learning tools for awareness.	Professional learning support providers collaborate to design and share professional learning tools for transition.	Professional learning support providers collaborate to design and share professional learning tools for implementation.
<b>TEACHER PROFESSIONAL LEARNING</b>	Professional learning support providers work with LEAs to design and deliver customized professional learning to raise awareness regarding CA NGSS.	Professional learning support providers work with LEAs and teachers to design and deliver professional learning that incorporate teachers' best practices for transitioning into CA NGSS.	Professional learning support providers work with LEAs and teachers to design and deliver professional learning that incorporate teachers' best practices for implementation of CA NGSS within the district and beyond.
	Professional learning support providers as individual organizations, and/or	The professional learning Support providers as individual organizations,	Professional learning support providers as individual organizations, and/or

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
	collaboratively, develop and deliver professional learning opportunities to address the CA NGSS awareness.	and/or collaboratively, develop and deliver professional learning opportunities to address the CA NGSS transition.	collaboratively, develop and deliver professional learning opportunities to address the CA NGSS implementation.

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## Introduction for Strategy 2: Instructional Resources

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***Provide CA NGSS-aligned instructional resources designed to meet the diverse needs of all students.***

Strategy 2 addresses the development, acquisition, and review of the CA NGSS-aligned instructional resources to meet the diverse needs of all students. Enactment of this strategy requires a collaborative partnership between and among the CDE, the LEAs, expanded learning providers, and support providers.

This strategy incorporates two changing contexts for instructional resources. The first is new instructional resources that are likely to be dynamic in format and content, e.g., digital materials, open educational resources, and hybrid programs. This provides a variety of options to the LEAs.

The Program Elements Matrix for Strategy 2 is organized into the following elements:

1. Development of the CA NGSS Curriculum Framework (CDE only)
2. Understand the Framework
3. Investigate and select instructional materials
4. Promote equity and access to instructional resources

**Development of the CA NGSS Curriculum Framework.** The CDE in cooperation with the Instruction Quality Commission is responsible for facilitating the development of the CA NGSS Curriculum Framework to be adopted by the SBE. SB300 (Chapter 480, Statutes of 2013) is the authorizing legislation for the revision of the Science Framework.

**Understand the Framework.** The *Science Framework for California Schools Grades K–12 (Science Framework)* provides support in implementing the CA NGSS for all students. The CDE in cooperation with stakeholders will conduct “roll-outs” of the *Science Framework* throughout California to provide information and examples of CA NGSS best practices. This element addresses the development, implementation, and evaluation of the “roll-outs” as well as next step strategies.

**Investigate and Select Instructional Materials.**

The 2016 Science Framework will contain the criteria for evaluating instructional materials in science, kindergarten through grade eight. The framework, standards, and criteria provide guidance to publishers and developers of instructional materials for the submission of materials for review. In turn, the criteria are also used by reviewers of instructional materials (K-8) submitted for adoption. If publishers meet all criteria, their materials are forwarded to the

Instructional Quality Commission (IQC) for possible recommendation to the SBE for adoption. For grades 9-12, LEAs are responsible for determining that instructional materials are aligned to content standards, are accessible for all students, and meet the local needs of schools.

**Promote Equity and Access to Instructional Resources.** This element addresses resources, information and strategies to facilitate equitable, quality, and safe science instruction.

To meet the instructional needs of diverse learners, California uses a Multi-Tiered System of Supports (MTSS) model that aligns all systems of high quality instruction, support, and intervention and includes structures for building, changing, and sustaining systems. MTSS occurs in the context of excellent curricula, effective instruction, and a comprehensive assessment system as well as effective leadership, professional learning, and an empowering culture for staff and students. The supports below are necessary as part of California's commitment to educating all students, including students with disabilities:

- Integrating the principals of Universal Design for Learning (UDL) in creating and delivering accessible curriculum and lesson plans;
- Modeling and highlighting the benefits of collaborative lesson planning (between special education and general education);
- Reinforcing the importance of adopting accessible materials that embed differentiated learning strategies based on student learning needs and not specific student labels, which is integral in meeting California's diverse student population;
- Ensuring that grade level reading proficiency is not a requirement for learning science and that every student should receive access to grade level science standards utilizing appropriate accommodations.

## Strategy 2

### California Department of Education Implementation Plan for the CA NGSS

Provide CA NGSS-aligned instructional resources designed to meet the diverse needs of all students.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>DEVELOPMENT OF THE CALIFORNIA NGSS CURRICULUM FRAMEWORK</b>	CDE will conduct focus groups to draft guidelines for the curriculum framework; IQC recommends guidelines and members for the Curriculum Framework and Evaluation Criteria Committee (CFCC); SBE approves guidelines for development and members of CFCC.	CFCC develops initial draft framework and presents it to the IQC; IQC conducts a 60-day field review of the framework and makes revisions. IQC takes action to recommend a draft framework to the SBE.	Draft framework is put out for second 60-day field review. IQC examines comments and makes recommendations for additional revisions. SBE acts on framework in January 2016.
<b>UNDERSTAND THE CALIFORNIA NGSS CURRICULUM FRAMEWORK</b>	The CDE in collaboration with LEAs and stakeholders develops presentations and workshops to roll-out the science framework.	The CDE in collaboration with LEAs and stakeholders develop a plan for presenters for regional framework roll-outs.	The CDE, LEAs, and stakeholders participate in the roll-out of the science framework and evaluate the reception of the frameworks; they subsequently revise existing resources and develop additional ones.
<b>INVESTIGATE AND SELECT INSTRUCTIONAL MATERIALS</b>	The Instructional Quality Commission recommends and the SBE adopts criteria for evaluating K-8 instructional materials in January 2016.	The SSPI recruits instructional materials reviewers (IMRs) and content review experts (CREs) for the review of materials submitted for SBE adoption consideration.	The Instructional Quality Commission (IQC) recommends and SBE adopts K-8 instructional materials in November 2017.
<b>PROMOTE EQUITY AND ACCESS TO INSTRUCTIONAL RESOURCES</b>	The CDE provides research-based guidance and information for districts to help determine the necessary instructional resources and facilities for equitable, high quality, and safe science	The CDE disseminates information about resources that facilitate equitable, high quality, and safe science instruction.	The CDE reviews state needs, evaluates the resources, and revises as needed.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
	instruction. This information will be presented in the Science Curriculum Framework and the Science Safety Handbook.		

## Strategy 2 Suggestions and Opportunities for LEAs

Provide CA NGSS-aligned instructional resources designed to meet the diverse needs of all students.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>UNDERSTAND THE FRAMEWORK</b>	The LEA selects and supports local representative(s) to attend framework roll-out sessions to plan for local implementation of the CA NGSS.	The LEA representative(s) train teacher leaders and curriculum leaders within the LEA to build local capacity for implementation of the CA NGSS.	Teacher leaders and curriculum leaders provide support at school sites to use the framework as a tool to implement the CA NGSS.
<b>INVESTIGATE AND SELECT INSTRUCTIONAL MATERIAL</b>	The LEA investigates, evaluates, and selects a process for determining instructional materials.	The LEA uses the selected process to investigate and select instructional materials and instructional resources that ensure access to science curriculum for all students, including English learners.	The LEA provides feedback to CDE on the criteria and shares any new resources for the evaluation of instructional materials.
<b>PROMOTE EQUITY AND ACCESS TO INSTRUCTIONAL RESOURCES</b>	The LEA uses the CDE information and resources to determine local needs for equitable, high quality, and safe science instruction for all students, including English learners.	The LEA uses results of needs assessment to prioritize the allocation of the funds for equitable facilities, equipment, and instructional resources that ensure access to science curriculum for all students, including English learners.	The LEA executes and evaluates the plan for equitable, high quality, and safe science instruction.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
	The LEA researches best practices in instructional time, and gathers data from a local needs assessment, to determine local needs for instructional time in science for grades K–12.	The LEA evaluates results of local needs assessment and research into best practices to establish instructional time for science in grades K–12.	The LEA schedules instructional time for science based on research and data, evaluates its effectiveness and adequacy for science instruction, and adjusts according to evaluation data.

## Strategy 2 Suggestions and opportunities for Support Providers

Provide CA NGSS-aligned instructional resources designed to meet the diverse needs of all students.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>UNDERSTAND THE FRAMEWORK</b>	Support providers, individually and collaboratively, plan strategies and activities to facilitate the roll-out of the science framework.	Support providers implement activities and strategies that facilitate the roll-out of the science framework.	Support providers evaluate strategies and activities and adjust according to local needs.
<b>INVESTIGATE AND SELECT INSTRUCTIONAL MATERIALS</b>	Support providers structure their educational services so they are aligned to CA NGSS and CA NGSS-aligned instructional materials.	Support providers provide educational services aligned to CA NGSS and CA NGSS-aligned instructional materials.	Support providers evaluate their educational services for alignment with CA NGSS and CA NGSS-aligned instructional materials and adjust accordingly.
<b>PROMOTE EQUITY AND ACCESS TO INSTRUCTIONAL RESOURCES</b>	Support providers determine their status in providing equitable, high quality, and safe science education and education services that	Support providers allocate resources to facilitate equitable, high quality, and safe science education and education services.	Support providers evaluate effectiveness of their science education and education services and adjust according to identified needs.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
	support all students, including English learners.		

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## Introduction for Strategy 3: Assessment

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***Develop and transition to CA NGSS-aligned assessment systems to inform instruction, establish priorities for professional learning and provide tools for accountability.***

Strategy 3 addresses the development of a high quality, CA NGSS aligned, assessment system to ensure that every K–12 student in California is prepared to demonstrate the depth of understanding required by the CA NGSS. To further ensure that every student attains this depth of understanding, teachers also will access English language proficiency (ELP) assessment results to identify language development needs to support and target science instruction for English learners (ELs). Enactment of this strategy requires a collaborative partnership of: the CDE, LEAs, and support providers.

This strategy incorporates several of the shifts in assessment practice as recommended by the CA NGSS. These include the analyses of student performance that will inform instruction, establish priorities for professional learning, and provide tools for accountability. The successful implementation of the CA NGSS aligned assessments should include a systemic and systematic approach to assessment. A major component of this approach is focusing on the three-dimensions of science teaching and learning (Science and Engineering Practices, Disciplinary Core Ideas, and Cross Cutting Concepts) required by the CA NGSS.

The Program Element Matrix for Strategy 3 is organized into the following three elements. These are not intended to indicate a particular order, just elements to be considered when developing and implementing CA NGSS assessments at any level.

1. Development of Formative Assessment Tools
2. Formative Assessment Professional Learning
3. Development of Statewide Assessment Tools

**Development of Formative Assessment Tools.** The first element focuses on the development of criteria for evaluating high quality formative assessment tools. These are tools and processes that are embedded in instruction and used by teachers and pupils to provide timely feedback for purposes of adjusting instruction to improve learning. It provides for the development of formative assessment tools intended for use by classroom teachers to inform their day-to-day practice. Examples of tools include day-to-day resources and interim tools that will be available to the LEAs in a digital center.

**Formative Assessment Professional Learning.** Element two focuses on the professional learning required for the successful development and implementation of locally developed formative assessments.

**Development of Statewide Assessment System.** The third element of this strategy outlines the process that is stipulated in Education Code (EC) Section 60640, for the CDE to implement in the development of a statewide assessment aligned to the CA NGSS. LEAs will analyze data generated by statewide assessments to inform curriculum, classroom instruction and professional learning for teachers and administrators.

### Strategy 3

## California Department of Education Implementation Plan for the CA NGSS

Develop and transition to CA NGSS-aligned assessment systems to inform instruction, establish priorities for professional learning and provide tools for accountability.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>DEVELOPMENT OF FORMATIVE ASSESSMENT TOOLS</b>	*The CDE, in collaboration with appropriate assessment professionals, develops criteria to evaluate available assessment resources and/or guide the development of new formative assessment resources and tools to inform science instruction.	*The CDE, in collaboration with appropriate assessment professionals, identifies and develops sample digital CA NGSS formative assessments, tools including samples of student work, performance task scoring rubrics, and other resources based upon the criteria developed in the awareness phase.	*The CDE makes available sample CA NGSS formative assessment tools and other assessment resources on the NGSS digital center.
<b>FORMATIVE ASSESSMENT PROFESSIONAL LEARNING</b>	*The CDE develops an assessment training guide or kit containing: Practice tests, training tests, test administration tools, test scoring and results analysis guides to be posted on the NGSS	* CDE collaborates with science stakeholders to conduct a review of professional learning opportunities related to the development of local formative science assessment tools.	*CDE, in collaboration with science stakeholders, conducts local and regional training sessions utilizing facilitation guides focused on strategies develop computer-based local

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
	digital center.		science formative assessment tools.
<b>DEVELOPMENT OF STATEWIDE SCIENCE ASSESSMENT SYSTEM</b>	*The CDE holds Science Stakeholder meetings to get input into science assessment needs and content recommendations.	*The CDE makes recommendations to the SBE based on recommendations from the Science Stakeholder meetings.	*The CDE develops, pilots, field-tests, and evaluates of a new statewide science assessment system.

### Strategy 3 Suggestions and Opportunities for LEAs

Develop and transition to CA NGSS-aligned assessment systems to inform instruction, establish priorities for professional learning and provide tools for accountability.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>DEVELOPMENT OF FORMATIVE ASSESSMENT TOOLS</b>	The LEAs use the CDE-developed criteria to evaluate available assessment resources and/or guide the development of new formative assessment resources for science instruction.	The LEAs implement chosen or developed formative assessment tools aligns with CA NGSS.	LEAs analyze student data from selected formative assessments and evaluate effectiveness of these assessment tools in informing instructional practice.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>FORMATIVE ASSESSMENT PROFESSIONAL LEARNING</b>	The LEAs, conduct a needs assessment of teacher and administrator knowledge of when and how to use formative assessment tools to inform instruction and to determine student learning.	The LEAs provide professional learning opportunities on formative assessment tools.	The LEAs implement formative assessment tools, provide a process for teachers to collaborate about results, and seek feedback on the effectiveness of these tools.
<b>DEVELOPMENT OF STATEWIDE ASSESSMENT SYSTEM</b>	The LEAs review state-provided guidance for implementation of statewide assessments.	The LEAs review their capacity to implement the statewide science assessment and make adjustments as needed.	The LEAs implement statewide science assessment pilots, field tests, and summative assessments as opportunities arise. The LEA evaluates its performance on pilot and field tests for additional needed capacity adjustments.

### **Strategy 3**

#### **Suggestions and Opportunities for Support Providers**

Develop and transition to CA NGSS-aligned assessment systems to inform instruction, establish priorities for professional learning and provide tools for accountability.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>DEVELOPMENT OF FORMATIVE ASSESSMENT</b>	Support providers research examples of high quality formative and benchmark assessment tools.	Support providers provide CDE and LEAs with formative assessment tools and training materials.	Support providers evaluate and revise tools provided to CDE and LEAs and post these tools on the NGSS digital center.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>TOOLS</b>			
<b>FORMATIVE ASSESSMENT PROFESSIONAL LEARNING</b>	Support providers develop professional learning opportunities for LEAs on identified formative and benchmark assessment tools.	Support providers provide professional learning opportunities for LEAs on identified formative and benchmark assessment tools.	Support providers evaluate effectiveness of professional learning opportunities provided for LEAs on identified formative and benchmark assessment tools.
<b>DEVELOPMENT OF STATEWIDE ASSESSMENT SYSTEM</b>	Support providers review statewide assessment information and guidelines and assessment recommendations found in the new <i>Science Framework</i> .	Support providers, in collaboration with the LEAs, review summative assessment strategies and evaluate assessments and curriculum design to determine alignment with the CA NGSS statewide summative assessment.	Support providers assist the LEAs with review of analysis of student data from statewide summative assessments to inform and revise curriculum, instruction, and local assessments.

## Introduction for Strategy 4: Parents and Guardians, Early Childhood, Expanded Learning

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***Collaborate with parents, guardians, and the early childhood and expanded learning communities to integrate the CA NGSS into programs and activities beyond the K-12 setting.***

Strategy 4 addresses the development and implementation of the CA NGSS-aligned collaborations with parents/guardians and the early childhood and expanded learning communities to incorporate the CA NGSS into programs and activities beyond the K–12 school setting. Enactment of this strategy requires a collaborative partnership of: the CDE, the LEAs, and support providers including but not limited to: parent groups, science centers and museums, county offices of education, professional learning providers, youth clubs/programs, and afterschool programs.

This strategy is designed to develop stakeholder awareness of the messages in the CA NGSS and increase educational opportunities for children during expanded learning experiences and out-of-school programs for all students in the K–12 system, including those learning English. Science is important for all children as it provides many opportunities for a variety of oral language development, pre-literacy, and literacy experiences. It also addresses early childhood education (birth to age five), as well as, learning opportunities provided by parents/guardians (e.g., family field trips to science centers, museums, parks, and zoos).

The Program Elements Matrix for Strategy 4 is organized into four elements:

1. Communication
2. Products and Tools
3. Professional Learning
4. Resources

**Communication.** This element includes developing public understanding of the CA NGSS through outreach campaigns and creating multimedia and multilingual activities and venues. The awareness phase defines a common understanding of the CA NGSS; the transition phase delineates collaborative action steps to work towards the CA NGSS implementation; the implementation phase includes broadening awareness; developing and revising plans; and measuring effectiveness.

**Products and Tools.** This element includes collaborative development of a variety of multimedia and multilingual tools. These tools include web portals, PowerPoint presentations, newsletter templates, tip sheets, moments of science,

careers, science in the environment, and hands-on modules and science kits for use by parents and after school clubs. The products and tools are disseminated and revised based on feedback.

**Professional Learning.** This element develops and disseminates professional learning resources for parents/guardians, early childhood, low income, English language learners, foster youth and expanded learning education. The PEM supports the use of the resources by stakeholders and updates the resources based on feedback.

**Resources.** This element defines the collaborative role of the CDE, LEAs, and support providers, to identify available resources and innovative programs for targeted audiences. The element also identifies and disseminates promising and innovative practices to various audiences.

### Strategy 4

## California Department of Education Implementation Plan for the CA NGSS

Collaborate with parents, guardians, and the early childhood and expanded learning communities to integrate the CA NGSS into programs and activities beyond the K-12 setting.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>COMMUNICATION</b>	<p>*The CDE seeks resources to develop a multi-media, multi-lingual public information outreach campaign with training modules about the CA NGSS differentiated for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>*The CDE guides development of the CA NGSS awareness training modules differentiated for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>*The CDE provides professional development opportunities on the use of the training modules, differentiated for specific target audiences, including:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	*The CDE works with stakeholders to develop a multi-media, multi-lingual public information outreach campaign about the CA NGSS.	*The CDE works with stakeholders to implement the multimedia, multi-lingual public information outreach campaign about the CA NGSS.	*The CDE works with stakeholders to evaluate and adjust the multimedia CA NGSS awareness campaign as indicated.
<b>PRODUCTS AND TOOLS</b>	The CDE works with stakeholders beyond the K-12 setting to determine their product and tool needs and to identify possible resource sources for their activities and programs to support awareness of CA NGSS.	The CDE works with stakeholders beyond the K-12 setting to determine their product and tool needs and to identify possible resource sources for their activities and programs to support transition to CA NGSS.	The CDE works with stakeholders beyond the K-12 setting to determine their product and tool needs and to identify possible resource sources for their activities and programs to support implementation of CA NGSS.
	The CDE reviews products and tools developed for and by stakeholders beyond the K-12 setting for possible posting on the NGSS digital center.	The CDE posts appropriate products and tools on the NGSS digital center.	The CDE seeks additional products and tools for posting on the NGSS digital center that would benefit stakeholders beyond the K-12 setting.
<b>PROFESSIONAL LEARNING</b>	*The CDE develops a professional learning plan for use with CA NGSS products and tools developed for diverse stakeholders beyond the K-12 setting.	*The CDE implements professional learning plan supporting use of products and tools developed for diverse stakeholders beyond the K-12 setting.	*The CDE evaluates and adjusts professional learning plan supporting use of products and tools developed for diverse stakeholders beyond the K-12 setting.
<b>RESOURCES</b>	The CDE researches resource opportunities to support innovative CA NGSS programs for: <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> </ul>	The CDE distributes information about resource opportunities to support innovative CA NGSS programs for: <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning</li> </ul>	The CDE reviews and disseminates products and best practices gained from resource opportunities.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	<ul style="list-style-type: none"> <li>Other settings outside of the K-12 community.</li> </ul>	<ul style="list-style-type: none"> <li>communities</li> <li>Other settings outside of the K-12 community.</li> </ul>	

### Strategy 4 Suggestions and Opportunities for LEAs

Collaborate with parents, guardians, and the early childhood and extended learning communities to integrate the CA NGSS into programs and activities beyond the K-12 setting.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>COMMUNICATION</b>	<p>The LEA facilitates a community process to leverage the state multi-media, multi-lingual public information outreach campaign plan and customize a local awareness campaign about the CA NGSS differentiated for:</p> <ul style="list-style-type: none"> <li>Parents and guardians</li> <li>Early childhood communities</li> <li>Expanded learning communities</li> <li>Other settings outside of the K-12 community.</li> </ul>	<p>The LEA uses the state-developed training modules to inform local leaders of the value and impact of CA NGSS on critical stakeholders, including:</p> <ul style="list-style-type: none"> <li>Parents and guardians</li> <li>Early childhood communities</li> <li>Expanded learning communities</li> <li>Other settings outside of the K-12 community.</li> </ul>	<p>The LEA evaluates effectiveness of the local awareness campaign and modules.</p>
<b>PRODUCTS AND TOOLS</b>	<p>The LEA researches and recommends the NGSS products and tools appropriate for the demographics of the education</p>	<p>The LEA provides support for implementation of NGSS products and tools by education providers beyond the K-12 setting.</p>	<p>The LEA seeks feedback on the effectiveness of the NGSS products and tools used by the providers, and seeks additional</p>

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	providers beyond the K-12 setting.		resources as needed.
	The LEA identifies possible resource opportunities for education providers beyond the K-12 setting.	The LEA assists these providers in applying for resources.	The LEA assists these providers in aligning resources received with the CA NGSS.
<b>PROFESSIONAL LEARNING</b>	<p>The LEA identifies professional learning needs for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>The LEA works with stakeholders to develop professional learning for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>The LEA works with stakeholders to provide, evaluate, and revise professional learning for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>
	The LEA works with stakeholders to identify leaders within the education providers beyond the K-12 setting.	LEA works with identified leaders collaborate to determine common CA NGSS professional learning needs of their respective education providers.	LEA works with identified leaders to develop and provide CA NGSS professional learning, products, and tools to education providers beyond the K-12 setting.
<b>RESOURCES</b>	<p>The LEA works with education providers beyond the K-12 setting to identify resource needs and research resource opportunities to support innovative CA NGSS programs differentiated for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>The LEA works with education providers beyond the K-12 setting to apply for resource opportunities to support innovative CA NGSS programs for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>The LEA works with education providers beyond the K-12 setting to implement and evaluate innovative CA NGSS programs for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>

## Strategy 4

### Suggestions and Opportunities for Support Providers

Collaborate with parents, guardians, and the early childhood and extended learning communities to integrate the CA NGSS into programs and activities beyond the K-12 setting.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>COMMUNICATION</b>	Support providers collaborate together with the CDE to identify training needs for CA NGSS training modules differentiated for educators beyond the K-12 setting.	Support providers collaborate together with the CDE to develop CA NGSS training modules for educators beyond the K-12 setting.	Support providers collaborate together with the CDE to deliver and evaluate CA NGSS training modules for educators beyond the K-12 setting.
	Support providers promote CDE-developed multi-media, multi-lingual CA NGSS outreach campaign.	Support providers inform CDE about impact and effectiveness of CA NGSS multi-media, multi-lingual outreach campaign.	Support providers work with CDE to determine additional outreach needs and/or to revise existing campaign.
<b>PRODUCTS AND TOOLS</b>	Support providers work collaboratively to determine instructional products and tools needs for stakeholder groups to implement CA NGSS instruction beyond the K-12 setting.	Support providers work collaboratively to develop and disseminate the identified CA NGSS products and tools. This could include posting on the CA NGSS digital center.	Support providers work collaboratively to evaluate and update the CA NGSS products and tools based on feedback from stakeholders.
<b>PROFESSIONAL LEARNING</b>	Support providers develop professional learning plans and facilitation guides for use with CA NGSS tools and kits for: <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> </ul>	Support providers implement professional learning plans that include facilitation guides for use with CA NGSS tools and kits available on NGSS digital center for:	Support providers update professional learning plans and facilitation guides available through the NGSS digital center.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	<ul style="list-style-type: none"> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	
	<p>Support providers, in collaboration with the CDE, identifies and/or develops statewide and regional leadership training opportunities, including but not limited to conferences, webinars, online tutorials, and workshops.</p>	<p>Support providers, in collaboration with the CDE, implements statewide and regional leadership training opportunities, including but not limited to, conferences, webinars, online tutorials, and workshops.</p>	<p>Support providers, in collaboration with the CDE, to evaluate and revise the NGSS leadership training.</p>
<b>RESOURCES</b>	<p>Support providers research resource opportunities from private foundations, federal agencies, and industry to support innovative CA NGSS Programs for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>Support providers distribute information about resource opportunities to support innovative CA NGSS programs for:</p> <ul style="list-style-type: none"> <li>○ Parents and guardians</li> <li>○ Early childhood communities</li> <li>○ Expanded learning communities</li> <li>○ Other settings outside of the K-12 community.</li> </ul>	<p>Support providers provide updated and continuing information about resource opportunities related to the CA NGSS to stakeholders and LEAs.</p>

## Introduction for Strategy 5: Postsecondary and Business Communities

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***Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.***

Strategy 5 addresses the collaboration with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college. Enactment of this strategy requires a collaborative partnership of: the CDE, LEAs, and support providers including but not limited to: business and industry, institutes of higher education, parent groups, professional learning providers, and nonprofit organizations.

This strategy is designed to establish networks interested in ensuring student preparation for career and college and for communicating to stakeholders how the NGSS relates to student success. The strategy also addresses the intersections of the CA NGSS with the Career Technical Education (CTE) Standards and makes connections to cultural nuances that help bridge different language groups to mainstream business communities.

The Program Elements Matrix for Strategy 5 is organized into three elements:

1. Identify Existing and Establish New Networks
2. Communication
3. College and Career Pathways

**Identify Existing and Establish New Networks.** This element includes the establishment of networks at the state, local, and regional levels. Through the implementation phases, this element builds on existing networks and expanding them to enable widespread dissemination of the link between the CA NGSS and career and college readiness.

**Communication.** This element includes developing information, resources, and professional learning opportunities to facilitate familiarity with and integration of the CA NGSS into the stakeholders' context. Throughout the implementation phases, the communication mechanisms and messages are refined to meet the needs of diverse audiences.

**College and Career Pathways.** This element addresses the intersection of the CA NGSS and the CTE Standards and how this synergistic relationship can be used to address 21<sup>st</sup> century skills and career and college goals at the local level. The element also addresses the use of identified resources (people and programs) to facilitate college and career exploration and preparation in science engineering and technology fields.

## Strategy 5

### California Department of Education Implementation Plan for the CA NGSS

Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>IDENTIFY EXISTING AND ESTABLISH NEW NETWORKS</b>	The CDE identifies higher education, business and industry, community members, and additional networks and stakeholder groups interested in ensuring student preparation for career and college.	The CDE participates in local, statewide and national discussions with these networks to convey the importance of high quality science education as part of ensuring that all students are prepared for success in career and college.	The CDE collaborates with relevant stakeholder networks to support and promote high quality science education as an integral part of college and career preparation.
<b>COMMUNICATION</b>	The CDE researches best practices and model programs that integrate CA NGSS into college and career preparation.	The CDE posts onto the NGSS digital center information about best practices and model programs that include CA NGSS as integral to career and college preparation.	The CDE seeks feedback, and continues to research new and additional best practices, that support the importance of implementing the CA NGSS as it relates to the success of students in career and college.
<b>COLLEGE AND CAREER PATHWAYS</b>	*The CDE develops a document that outlines the intersections of the CA NGSS with the Career Technical Education (CTE) Standards in relationship to 21 <sup>st</sup> century skills and college and career goals.	*The CDE disseminates the document, and provides briefings and professional learning opportunities, to outline the intersection of the CA NGSS and the CTE standards in relationship to 21 <sup>st</sup> century skills and college and career goals.	*The CDE works with teacher preparation programs to ensure that academic and CTE teacher candidates across the state have information and strategies necessary to include the CA NGSS in their programs of study.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	<p>*The CDE identifies resources to facilitate college and career exploration and preparation in science, engineering, and technology fields.</p>	<p>*The CDE posts, on the NGSS digital center, information about identified resources for college and career exploration and preparation in science, engineering, and technology fields.</p>	<p>*The CDE provides training in the access and use of resources on the NGSS digital center to facilitate college and career exploration and preparation in science, engineering, and technology fields.</p>
	<p>*The CDE identifies post-secondary education and K–12 providers engaged in preparing California youth for college and careers in science, engineering, and technology fields.</p>	<p>*The CDE invites identified post-secondary and K–12 education partners to join an initiative to develop a recommended state pathway and articulated transition plans (i.e., K–5, 6–8, 9–12, post-secondary), including consistent implementation of the CA NGSS, so that all students will have the opportunity to pursue college and careers in science, engineering, and technology fields.</p>	<p>*The CDE and initiative participants seek feedback, revise the plan according to feedback, and begin implementation of state pathway and transition plan.</p>

## Strategy 5

### Suggestions and Opportunities for LEAS

Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>IDENTIFY EXISTING AND ESTABLISH NEW NETWORKS</b>	The LEA identifies higher education, business, additional local networks, and stakeholder groups interested in ensuring student preparation for career and college.	The LEA leverages the partnerships developed in existing college and career programs to engage members of higher education, business, local networks, and stakeholder groups in discussions regarding the CA NGSS and its relation to student success in career and college.	The LEA works with existing programs and the participating members of higher education, business, local networks, and stakeholder groups to identify appropriate communication networks within each organization and to disseminate information regarding the CA NGSS and its relation to student success in career and college.
<b>COMMUNICATION</b>	The LEA identifies all local stakeholder groups engaged in college and career preparation of local youth.	The LEA collaborates with relevant stakeholder groups to develop and provide information, resources, and professional learning opportunities to facilitate familiarity with and integration of the CA NGSS as appropriate.	The LEA supports and collaborates with relevant stakeholder groups to develop a feedback loop to update and expand resources and information.
<b>COLLEGE AND CAREER PATHWAYS</b>	The LEA provides opportunities for teachers to review and suggest applications of the CDE document that outlines the intersections of the CA NGSS with the Career Technical Education (CTE) Standards in relationship to 21 <sup>st</sup> century skills and college and career goals.	The LEA disseminates the document, and provides briefings and professional learning opportunities, to facilitate integration of the CA NGSS and the CTE standards in relationship to 21 <sup>st</sup> century skills and college and career goals.	The LEA works with local new teacher induction programs to ensure that all newly hired academic and CTE teachers have information and strategies necessary to integrate the CA NGSS into their programs of study.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	<p>The LEA identifies appropriate resources posted on the NGSS digital center, and seeks additional local resources, to facilitate college and career exploration and preparation in science, engineering, and technology fields.</p>	<p>The LEA provides training for local teachers and stakeholders focused on the access and use of resources for college and career exploration and preparation in science, engineering, and technology fields.</p>	<p>The LEA supports access and use of resources and programs that facilitate college and career exploration and preparation in science, engineering, and technology fields.</p>
	<p>The LEA identifies regional post-secondary education and K-12 providers engaged in preparing California youth for college and careers in science, engineering, and technology fields.</p>	<p>The LEA invites identified post-secondary and K-12 education partners to join a regional initiative to develop a recommended pathway and articulated transition plan (i.e., K-5, 6-8, 9-12, post-secondary), including consistent implementation of the CA NGSS, so that all students will have the opportunity to pursue college and careers in science, engineering, and technology fields.</p>	<p>The LEA, in collaboration with initiative participants, seeks feedback, revises plan according to feedback, and begins implementation of regional pathway and transition plan.</p>

## Strategy 5

### Suggestions and Opportunities for Support Providers

Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>IDENTIFY EXISTING AND ESTABLISH NEW NETWORKS</b>	Support providers identify higher education, business, additional local networks, and stakeholder groups interested in ensuring student preparation for career and college.	Support providers leverage partnerships developed in existing college and career programs to engage members of local business and postsecondary communities in discussions regarding the CA NGSS and student success in career and college.	Support providers work with the LEAs and the CDE to identify appropriate communication networks within each organization and to disseminate information regarding the CA NGSS and its relation to student success in career and college.
<b>COMMUNICATION</b>	Support providers identify local businesses, post-secondary and stakeholder groups engaged in college and career preparation of local youth.	Support providers collaborate with relevant stakeholder groups to provide resources, information and feedback loops about the CA NGSS directly relevant to the various stakeholders.	Support providers use feedback to update and expand resources and information and to facilitate collaboration with college and career preparation stakeholders.
<b>COLLEGE AND CAREER PATHWAYS</b>	Support providers work with appropriate community organizations to facilitate understanding and potential use of the CDE document that outlines the intersections of the CA NGSS with the CTE Standards in relationship to 21 <sup>st</sup> century skills and college and career goals.	Support providers disseminate the CA NGSS-CTE intersection document, and provide briefings and professional learning opportunities, to facilitate integration of the CA NGSS and the CTE standards in relationship to 21 <sup>st</sup> century skills and college and career goals.	Support providers collect and disseminate best practices information, and provide on-going professional learning opportunities, on the integration of the CA NGSS and the CTE standards.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
	<p>Support providers identify state and local resources to facilitate college and career exploration and preparation in science, engineering, and technology fields.</p>	<p>Support providers access state and local resources to facilitate students' college and career exploration and preparation in science, engineering, and technology fields.</p>	<p>Support providers identify, coordinate, and provide work-place opportunities for teachers to experience, and for students to explore and prepare for, college and careers in science, engineering, and technology fields.</p>
	<p>Support providers collaborate with LEAs to identify regional stakeholders engaged in preparing California youth for college and careers in science, engineering, and technology fields.</p>	<p>Support providers, in collaboration with LEAs, invite identified stakeholders to join a regional initiative to develop a recommended pathway and articulated transition plan (i.e., K–5, 6–8, 9–12, post-secondary), including consistent implementation of the CA NGSS, so that all students have the opportunity to pursue college and careers in science, engineering, and technology fields.</p>	<p>Support providers, in collaboration with LEAs, seek feedback, revise plan according to feedback, and support the beginning implementation of the regional pathway and transition plan.</p>

## Introduction for Strategy 6: Resources

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***Seek, create, and disseminate resources to support stakeholders as the CA NGSS systems implementation moves forward.***

Strategy 6 addresses ways to seek, create, and disseminate resources to support stakeholders throughout and beyond the implementation phase of the CA NGSS. Enactment of this strategy requires a collaborative partnership between and among the CDE, LEAS, and support providers, including a broad array of nonprofit organizations.

This strategy describes a multi-tiered approach to ensure purposeful identification, development, and dissemination of resources to implement the CA NGSS. The term “resources” is used to describe time, people, funding, physical materials including facilities to do science and engineering, intellectual materials, and community resources. Several strategies in the state plan specify resources that are generically suggested in Strategy 6. For example Strategy 2 specifies resources for instruction. Strategy 1 specifies resources for professional learning, and Strategy 4 outlines resources for informing parents, guardians, early childhood, and expanded learning communities.

The Program Elements Matrix for Strategy 6 is organized into the following elements:

1. Resource Needs
2. Seek and Create Resources
3. Disseminate Resources
4. Stakeholder Incentives

**Resource Needs.** Resources to implement the CA NGSS will be different for each stakeholder group and stakeholders will need to identify their needs before refining current or seeking additional resources. This element provides suggested activities to develop a resource needs assessment to be used by the CDE, the LEAs, and support providers. This element also strongly advises the development of specifications for resources and a feedback loop to adjust specifications for resources.

**Seek and Create Resources.** This element follows a similar pattern of activities for the CDE, the LEA, and support providers. The awareness phase uses the specifications developed in the resource needs element to seek resources aligned to the CA NGSS. During the transition phase resources are modified, obtained, and created to address

stakeholder needs. The focus in the implementation phase is to establish feedback loops to ensure sustainability of the NGSS implementation.

**Disseminate Resources.** This element describes a mechanism for dissemination: the creation and maintenance of a NGSS digital center. Key features of the NGSS digital center should include: a secure interactive platform, options for uploading and downloading resources, use of search engines, user reviews, and access by all stakeholders. Additional features include: community spaces, options for resources organized by region, and professional learning community spaces, etc. The awareness phase strongly recommends developing this NGSS digital center and making it accessible to all stakeholders. Activities during transition and implementation phases describe mechanisms for disseminating resources, which include training and updates of the central repository.

**Stakeholder Incentives.** This element addresses the importance of support and active cooperation of all stakeholders for a successful CA NGSS implementation and encourages participation from multiple and diverse stakeholders. Activities include identification of incentives, criteria for allocation of incentives, and evaluation of effectiveness of incentives. Criteria for incentives vary across different roles (CDE, LEA, support provider) dependent on mission and goals. Examples of incentives may include: state and local recognition, awards, funding, and access to resources and opportunities.

## Strategy 6

### California Department of Education Implementation Plan for the CA NGSS

Seek, create, and disseminate resources to support stakeholders as the CA NGSS systems implementation moves forward.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>RESOURCE NEEDS</b>	*The CDE, in collaboration with stakeholders, develops an CA NGSS resource needs assessment tool to assist LEAs in determining CA NGSS implementation needs.	*The CDE posts the CA NGSS resource needs assessment tool on the NGSS digital center.	*The CDE disseminates information and provides webinars to assist LEAs in the use of the CA NGSS resource needs assessment tool.
<b>SEEK AND CREATE RESOURCES</b>	The CDE conducts a nation-wide search for resources to support CA NGSS implementation.	*The CDE establishes a secure online mechanism to gather, review, and share resources on the NGSS digital center.	*The CDE develops a feedback mechanism to determine if the resources meet the needs of California schools.
	The CDE, in collaboration with stakeholders, identifies CA NGSS implementation gaps and needs.	The CDE and stakeholders research appropriate resources and strategies to meet those needs.	*The CDE accesses available resources, and seeks funding to develop new resources, to meet identified CA NGSS implementation gaps and needs.
<b>DISSEMINATE RESOURCES</b>	*The CDE develops and disseminates resources through the NGSS digital center.	*The CDE develops mechanisms to update existing resources and provide notification of updates.	*The CDE collaborates with stakeholders to maintain the NGSS digital center.
<b>STAKEHOLDER INCENTIVES</b>	*The CDE develops criteria for state recognition to acknowledge the development, augmentation or evaluation of resources on the NGSS digital center.	*The CDE issues state recognition to acknowledge the development, augmentation or evaluation of resources on the NGSS digital center.	*The CDE uses feedback from stakeholders to evaluate success of state recognition and revise as needed.

## Strategy 6 Suggestions and Opportunities for LEAs

Seek, create, and disseminate resources to support stakeholders as the CA NGSS systems implementation moves forward.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>RESOURCE NEEDS</b>	The LEA utilizes resource needs assessment tool developed by CDE and stakeholders to determine CA NGSS implementation resource needs.	The LEA uses data from resource needs assessment tool to identify, prioritize, and allocate resources and funding.	The LEA allocates resources and funding and uses feedback from stakeholders to revise resource allocation on an as-needed basis.
<b>SEEK AND CREATE RESOURCES</b>	The LEA investigates resources available on the NGSS digital center, resources within the LEA, and resources from Support Providers.	The LEA evaluates available resources, modifies existing resources to meet local needs, and creates new resources to fill resource gaps.	The LEA provides new resources to NGSS digital center for review for state posting and gives feedback on NGSS digital center resources used.
<b>DISSEMINATE RESOURCES</b>	The LEA disseminates appropriate resources for CA NGSS awareness and evaluates effectiveness for planning next phase of NGSS resource allocation.	The LEA disseminates appropriate resources for CA NGSS transition evaluates effectiveness for planning next phase of CA NGSS resource allocation.	The LEA disseminates appropriate resources for CA NGSS implementation evaluates effectiveness for planning next phase of CA NGSS resource allocation.
<b>STAKEHOLDER INCENTIVES</b>	The LEA identifies appropriate recognition for teachers that seek, create, and disseminate resources that support CA NGSS implementation.	The LEA develops a local incentive system to recognize teachers that seek, create, and disseminate resources that support CA NGSS implementation.	The LEA implements incentive system and evaluates effectiveness.

## Strategy 6

### Suggestions and Opportunities for Support Providers

Seek, create, and disseminate resources to support stakeholders as the CA NGSS systems implementation moves forward.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>RESOURCE NEEDS</b>	Support providers utilize the CDE CA NGSS resource needs assessment tool with modifications for each stakeholder group.	Support providers use data from resource needs assessment tool to identify, prioritize, and allocate resources and funds.	Support providers allocate resources and use feedback from stakeholders to revise resource allocation on an as-needed basis.
<b>SEEK AND CREATE RESOURCES</b>	Support providers identify and allocate current resources aligned to the CA NGSS appropriate for the awareness phase of implementation.	Support providers modify existing resources and create new resources aligned to the CA NGSS and appropriate for the transition phase of implementation.	Support providers utilize feedback from stakeholders to modify and create resources appropriate for the implementation phase.
<b>DISSEMINATE RESOURCES</b>	Support providers build intra and inter agency awareness of the CA NGSS aligned resources appropriate for the awareness phase of implementation.	Support providers build intra and inter agency use of the CA NGSS aligned resources appropriate for the transition phase of implementation.	Support providers build intra and inter agency use of the CA NGSS aligned resources appropriate for the implementation phase.
	Support providers work with LEAs to plan dissemination of resources.	Support providers work with LEAs to provide professional learning opportunities for teacher leaders to learn how to use CA NGSS aligned resources.	Support providers and LEAs implement, disseminate, and evaluate with feedback CA NGSS aligned resources.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>STAKEHOLDER INCENTIVES</b>	Support providers identify available resources to be offered as incentives to support the CA NGSS implementation.	Support providers work with LEAs to develop a local incentive system to recognize teacher use of the CA NGSS aligned resources.	Support providers work with LEAs to implement incentive system and evaluate effectiveness.

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## Introduction for Strategy 7: Communication

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***Design and establish systems of effective communication among stakeholders to continuously identify areas of need and disseminate information.***

Strategy 7 addresses the design and establishment of effective communication systems among stakeholders to continuously disseminate information to meet the needs of various stakeholders throughout the CA NGSS implementation. Enactment of this strategy requires a collaborative partnership between and among the CDE, LEAs, and support providers.

This strategy addresses two overarching communication needs. First is the need for a multi-lingual and multi-media communication system and associated tools. This system would include a NGSS digital center that supports Strategies 1–6, and provide a two-way communication system among stakeholder groups. The second need is for a public outreach, awareness, and education campaign for all stakeholders that informs and promotes the benefits of the CA NGSS. Public awareness is also addressed in Strategy 8 Building Coalitions and in Strategy #4 Parents/Guardians, Early Childhood and Expanded Learning Communities.

The Program Elements Matrix for Strategy 7 includes the following four elements:

1. Stakeholders
2. Communication Tools
3. Professional Learning
4. Resources

**Stakeholders.** This element identifies stakeholders as targeted audiences to receive and contribute to the communication plan. The element also identifies the needs for a communication system (e.g. teacher to teacher, support group to teachers, support group to parents, early childhood learning and expanded learning, business and industry, higher education).

**Communication Tools.** This element identifies necessary communication tools and systems to effectively implement Strategies 1–6. It also addresses public awareness tools. Multi-media (e.g. web-based, as well as, face to face, social-media, printed materials, videos, webinar, TV) and multi-lingual tools are included for all stakeholders. Included in this

element is the development of a NGSS digital center. This portal is intended to be a secure interactive central repository with options for uploading and downloading vetted resources, use of search engines, user reviews, and access by all stakeholders. Additional features include: community spaces, options for resources organized by region, and professional learning community spaces for a variety of stakeholders. The repository will also host the evolving public awareness campaign materials.

**Professional Learning.** This element focuses providing support on the use of the communication system to a variety of audiences. Over the course of the CA NGSS implementation, this element addresses changing needs in the use of the communication system and on messaging for public awareness.

**Resources.** The resource element suggests roles for the CDE, the LEAs, and support providers to identify and secure resources for development and maintenance of the communication system. Similarly, it suggests roles for the public awareness campaign.

### Strategy 7

## California Department of Education Implementation Plan for the CA NGSS

Design and establish systems of effective communication among stakeholders to continuously identify areas of need and disseminate information.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>STAKEHOLDERS</b>	The CDE will determine the most effective ways to communicate respectively with LEAs, support providers, and other stakeholders.	The CDE uses the various communication systems and tools to communicate about CA NGSS information and resources.	The CDE evaluates effectiveness of these communication systems and tools.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>COMMUNICATION TOOLS</b>	*The CDE collaborates with stakeholders and web developing experts to research options for creating a site for CA NGSS resources and communications. This web site will be entitled the NGSS digital center.	*The CDE contracts with a web developing expert to create the NGSS digital center.	*The CDE posts resources and communications, evaluates new materials for posting, and continually updates the NGSS digital center according to feedback.
	*The CDE leads collaboration among support groups and local stakeholders to identify necessary communication tools such as face-to-face, social media, printed materials, videos, and webinars in support of all strategies.	*The CDE, in collaboration with support groups and local stakeholders, develops tools for communication to populate the NGSS digital center.	*The CDE adapts and refines communication tools and systems through feedback from stakeholders.
	*The CDE designs an outreach campaign to develop and launch the multi-media NGSS digital center.	*The CDE facilitates implementation of the outreach campaign, including collaboration with LEAs, support providers, and other stakeholders.	*The CDE adjusts the outreach campaign according to feedback and specific stakeholder needs.
<b>PROFESSIONAL LEARNING</b>	*The CDE develops a plan for utilizing communications systems and tools, including the NGSS digital center, to effectively implement strategies.	*The CDE develops professional learning opportunities for stakeholders on how to use/access the communication system and tools, including the NGSS digital center.	*The CDE implements the delivery of professional learning through the communication system and tools, including the NGSS digital center, and provides on-going support for stakeholders.
<b>RESOURCES</b>	*The CDE identifies funding needs for time, money, and staff to develop, implement and maintain all aspects of a communications system and tools, including the NGSS digital center.	*The CDE researches and requests/applies for funding to provide time, money and staff to implement the communications system.	*The CDE implements the communications system and tools, including the NGSS digital center when sufficient funding and resources are allocated.

## Strategy 7

### Suggestions and Opportunities for LEAs

Design and establish systems of effective communication among stakeholders to continuously identify areas of need and disseminate information.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>STAKEHOLDERS</b>	The LEA facilitates a community process to identify key stakeholders to survey local communication needs.	The LEA and key stakeholders assist with researching and developing communications and tools for the NGSS digital center.	The LEA evaluates the resources posted and the use of the system and suggests revisions based on user feedback.
<b>COMMUNICATION TOOLS</b>	The LEA customizes a local awareness campaign about the CA NGSS using tools on the NGSS digital center.	The LEA encourages use of the NGSS digital center by teachers and administrators, parents and students, business and community partners, and other stakeholders.	The LEA makes recommendations to CDE to adapt and refine tools and communications based on user feedback.
<b>PROFESSIONAL LEARNING</b>	The LEA develops a plan for utilizing communication systems and tools, including the NGSS digital center to effectively implement all strategies.	The LEA develops, locates existing, and/or works with support providers to implement professional learning opportunities for stakeholders on how to use/access the communication and tools located on the NGSS digital center.	The LEA evaluates professional learning processes and outcomes and revises accordingly.
<b>RESOURCES</b>	The LEA researches resources to support LEA participation in the NGSS digital center, other communications tools, and professional development.	The LEA allocates resources to support LEA participation in the NGSS digital center, other communications tools, and professional development.	The LEA works to gather evaluation data about the effectiveness of the communication system and provide financing for needed updates and modifications.

## Strategy 7

### Suggestions and Opportunities for Support Providers

Design and establish systems of effective communication among stakeholders to continuously identify areas of need and disseminate information.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>STAKEHOLDERS</b>	Support providers collaborate with local LEAs to define who their local stakeholders are and how to communicate effectively with them.	Support providers collaborate with the CDE and the LEAs to publicize the communication system available to stakeholders on the NGSS digital center.	Support providers collaborate with the CDE and the LEAs to evaluate use of the communication system and provide feedback.
<b>COMMUNICATION TOOLS</b>	Support providers collaborate with one another, with local stakeholders (LEAs) and with the CDE to identify necessary communication tools and systems, such as comprehensive digital center, face-to-face, social media, printed materials, videos, webinars and TV to effectively implement all strategies.	Support providers, in collaboration with one another and with local stakeholders (LEAs), develop tools for communication among groups.	Support providers work with the CDE to adapt and refine tools through feedback from Support Providers and local LEA stakeholders.
	Support providers work with CDE and LEAs to launch an NGSS outreach campaign.	Support providers engage in NGSS outreach through the outreach campaign and through continual contact with stakeholders.	Support providers evaluate effectiveness of outreach campaign based on feedback from local stakeholders and recommend updates as needed.
<b>PROFESSIONAL LEARNING</b>	Support providers develop a plan for utilizing communication systems and tools, including the NGSS digital center.	Support providers develop a schedule of professional learning events for stakeholders on how to use/access the communication system and tools, including the NGSS digital center.	Support providers implement the delivery of content (communication system) and provide support for stakeholders using the system and tools, including the NGSS digital center

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
			and revise based on user feedback.
<b>RESOURCES</b>	Support providers research resources to support participation in the NGSS digital center, other communications tools, and professional learning.	Support providers allocate resources to support LEA participation in the NGSS digital center, other communications tools, and professional learning.	Support providers work to gather evaluation data about the effectiveness of the communication system and provide input on needed updates and modifications.

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## Introduction for Strategy 8: Coalition Building

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***Build coalitions to ensure a common message and to sustain momentum during implementation.***

Strategy 8 addresses the design and implementation of coalitions of people who have joined together for the common purpose of supporting the quality implementation of the CA NGSS. The enactment of this strategy requires a collaborative partnership of: the CDE, LEAs, expanded learning professionals, and the support providers including but not limited to: business and industry, county offices of education, professional learning providers, institutes of higher education, professional organizations, science centers and museum, science informal education providers, and public media providers.

This strategy represents community advocacy, rather than an education-only advocacy, and therefore includes parents, business, and other interested community members as well as educators. The purpose of coalition building is to provide momentum and develop consistent messages that are responsive to the needs of the field at all levels: state, regional, and local. The messages are tailored to a variety of audiences to build understanding, foster interest, and lay the foundation for broad support of the quality implementation of the CA NGSS.

The Program Elements Matrix for Strategy 8 is organized into the following three elements:

1. Coalition Building
2. Messages
3. Dissemination

**Coalition Building.** This element addresses the identification and establishment of coalitions and their members over the course of the CA NGSS implementation and beyond. The coalitions are viewed as changing and expanding entities with multiple and diverse members who have vested interests in the effective implementation of the CA NGSS. This element addresses coalitions at the state and local levels and how support providers can inform and support each.

**Messages.** This element addresses the need for consistent messaging across the state tailored to targeted audiences. The messages are responsive to the changing needs throughout the implementation of the NGSS and beyond. The messages are relevant to the state, regional, and local contexts. Further, the messages are data driven and support components of the system (e.g., professional learning, instructional materials, assessments, resources, funding) necessary for quality implementation.

**Dissemination.** This element addresses the development of materials based on tailored messages that are distributed to a variety of audiences. Materials can be multi-media (including print and electronic) and are multilingual and adaptable (for hearing or vision impaired). The materials deliver the coalitions' advocacy messages for universal and high quality implementation of the CA NGSS. The messages will be modified and refined as needed and appropriate.

## Strategy 8 California Department of Education Implementation Plan for the CA NGSS

Build coalitions to ensure a common message and to sustain momentum during implementation.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>COALITION BUILDING</b>	The CDE identifies an inclusive strategy to determine who should be in the expanded state coalition and participates as a coalition member.	*The CDE convenes the initial coalition meeting to establish meeting schedules and determine governance of the coalition.	The CDE helps recruit and identify new coalition members as needed.
<b>MESSAGES</b>	The CDE, as a member of the coalition, helps to craft a consistent message to promote an understanding of the innovations found in CA NGSS and the importance of science education.	The CDE, as a member of the coalition, helps to craft a consistent message that outlines progress made in California schools and identifies needs for CA NGSS implementation.	The CDE, as a member of the coalition, helps to craft a consistent message that outlines the scope and depth of implementation and the needs for sustaining CA NGSS implementation.
<b>DISSEMINATION</b>	*The CDE, as a member of the coalition, helps develop materials for multiple audiences regarding the CA NGSS awareness and	*The CDE, as a member of the coalition, helps develop materials for multiple audiences regarding the CA NGSS transition and leverages the	*The CDE, as a member of the coalition, helps develop and refine materials for multiple audiences regarding the CA NGSS implementation to sustain

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
	leverages the expertise of the coalition.	expertise of the coalition.	momentum and leverages the expertise of the coalition to sustain ongoing coalition activities and initiatives.

### **Strategy 8** **Suggestions and Opportunities for LEAs**

Build coalitions to ensure a common message and to sustain momentum during implementation.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>COALITION BUILDING</b>	The LEA collaborates with stakeholders to identify members who should be on the local coalition, participates as a member of the coalition, and contributes an understanding of awareness issues.	The LEA convenes and participates in local coalition to identify common goals and activities and contributes an understanding of transition issues.	The LEA helps recruit and identify coalition members as membership changes and contributes an understanding of implementation issues.
<b>MESSAGES</b>	The LEA, as a member of the coalition, gathers local and state data to craft consistent messages for targeted local audiences to promote an understanding of the innovations found in the CA NGSS and the importance of science education.	The LEA, as a member of the coalition, gathers local and state data to craft consistent messages for targeted local audiences that outline the progress made in local schools, and identifies needs for implementation.	The LEA, as a member of the coalition, gathers local and state data to craft consistent messages for targeted local audiences that outline the scope and depth of implementation and the needs for sustaining implementation.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>DISSEMINATION</b>	The LEA, as a member of the coalition, helps develop messaging materials for multiple audiences and entry points around CA NGSS awareness and leverages the expertise of the coalition.	The LEA, as a member of the coalition, helps develop and disseminate messaging materials for multiple audiences to advocate for the components required for a successful transition to the CA NGSS and leverages the expertise of the coalition.	The LEA, as a member of the coalition, helps develop and disseminate materials for multiple audiences around the CA NGSS implementation, continues to advocate for quality implementation, and leverages the expertise of the coalition to sustain ongoing coalition activities and initiatives.

**Strategy 8**  
**Suggestions and Opportunities for Support Providers**

Build coalitions to ensure a common message and to sustain momentum during implementation.

<b>ELEMENT</b>	<b>AWARENESS</b>	<b>TRANSITION</b>	<b>IMPLEMENTATION</b>
<b>COALITION BUILDING</b>	Support providers collaborate with CDE and LEAs to conduct a science needs assessment, identify potential state and local coalition members, and help facilitate the development of statewide and local coalitions on high quality CA NGSS implementation.	Support providers collaborate with CDE and LEAs to convene coalitions, determine leadership structure, and identify common goals and activities.	Support providers collaborate with CDE and LEAs to provide continuing support of statewide and local coalitions, continuously refine goals and activities, track outcomes, recruit new coalition members, and facilitate communication.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>MESSAGES</b>	Support providers collaborate with other coalition members to gather local and state data to craft consistent messages for target audiences to promote an understanding of the innovations found in the CA NGSS and the importance of science education.	Support providers collaborate with other coalition members to gather local and state data to craft consistent messages for target audiences that outline progress made and identify needs for implementation.	Support providers collaborate with other coalition members to gather local and state data to craft consistent messages for target audiences that outline the scope and depth of implementation and the needs for sustaining implementation.
<b>DISSEMINATION</b>	Support providers collaborate with members of the coalition to collect CA NGSS information and advocacy materials and customize for various audiences, and they leverage the expertise of the coalition.	Support providers collaborate with members of the coalition to help develop and disseminate messaging materials for multiple audiences to advocate for the components required for the successful transition to the CA NGSS, and they leverage the expertise of the coalition.	Support providers collaborate with members of the coalition to help develop and disseminate messaging materials for multiple audiences to advocate for the components required for successful implementation of the CA NGSS, and they leverage the expertise of the coalition to sustain ongoing activities and initiatives.

## **Appendix A: Evaluation of the Progress and Effectiveness of the Next Generation Science Standards Systems Implementation Plan for California**

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### **Overall Plan**

The evaluation plan is designed to capture the successes, challenges, and issues that the CDE, the LEAs, and support providers face as they move along the implementation of the NGSS from awareness to implementation. The CDE in collaboration with stakeholders will develop a survey, utilizing the PEMs as an evaluation tool, to be administered annually for the first four years of implementation.

The CDE will administer the evaluation survey to the CDE, the support providers, and the LEAs throughout the state. In addition, support providers (e.g., expanded learning communities, professional learning providers, and county offices of education) will nominate targeted LEAs to complete the surveys with commentary. Survey data will be analyzed by the CDE and results will be reported for the CDE, the support providers, and the LEAs. Results from the targeted LEAs will provide a clearer analysis of which indicators are being met and which are roadblocks for moving through the implementation phases. Recommendations based on those results will be reported to the SBE yearly for the first four years of implementation.

### **The Evaluation Tool**

The PEM, with its elements and indicators of progress on the continuum will serve as the tool for the evaluation. Each strategy in this document is presented with elements and indicators of progress on a continuum from awareness to implementation. To use this document as an evaluation tool, each stakeholder (CDE, LEAs, or support providers) determines their current status based on the indicators on each element of the PEM. Stakeholders determine whether or not the description represented by the indicators describes where they are on the continuum of implementation.

For example, Strategy 1 for CDE presents the element, “RESOURCES FOR TEACHER/ ADMINISTRATOR PROFESSIONAL LEARNING”. Three CA NGSS workshops are cited along the continuum from awareness to implementation. The CDE, in partnership with other professional learning stakeholder organizations, has already conducted the CA NGSS several awareness roll-out workshops. In evaluating the CDE’s progress, one can look at this qualitatively or quantitatively. It could be said that the CDE is still operating in the awareness phase for this element, and it has completed one awareness phase activity. It could also be said that CDE has completed 50% of the awareness workshops and has 100% of the transition and implementation workshops to accomplish. By looking at the elements, each stakeholder can track their progress toward implementation of the CA NGSS.

The CDE, the LEAs, and the support providers would enter their analysis on the CDE Evaluation Survey. Targeted LEAs would be asked to enter commentary as to successes or roadblocks for each element.

### Strategy 1

#### California Department of Education Implementation Plan for the CA NGSS

Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.

ELEMENT	AWARENESS	TRANSITION	IMPLEMENTATION
<b>RESOURCES FOR TEACHER/ ADMINSTRATOR PROFESSIONAL LEARNING</b>	*The CDE participates with other professional learning stakeholder organizations to convene CA NGSS Awareness Workshops for local teams of teachers and administrators.	*The CDE participates with other professional learning stakeholder organizations to convene CA NGSS Transition Workshops for local teams of teachers and administrators.	*The CDE participates with other professional learning stakeholder organizations to convene CA NGSS Implementation Workshops for local teams of teachers and administrators.

## Appendix B: Next Generation Science Standards Resources

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The following is a beginning list of resources that may be useful to support teachers, administrators, and support providers as they begin to implement the Next Generation Science Standards

### California Department of Education Resources

- ❖ A Blueprint for Great Schools: <http://www.cde.ca.gov/eo/in/bp/documents/yr11bp0709.pdf>
- ❖ *A Look at Kindergarten Through Grade Six, and Grades Seven and Eight, in California Public Schools:* <http://www.cde.ca.gov/ci/cr/cf/grlevelcurriculum.asp>
- ❖ A Vision for Expanded Learning in California, Strategic Plan 2014–2016: <http://www.cde.ca.gov/ls/ba/cp/documents/asdstrategicplan.pdf>
- ❖ Alignment of the Preschool Learning Foundations: <http://www.cde.ca.gov/sp/cd/re/psalignment.asp>
- ❖ California Alternative Discipline Specific Model for Grades 6–8: <http://www.cde.ca.gov/pd/ca/sc/ngsstandards.asp>
- ❖ California Assembly Bill 899 – Webber; English Language Development Standards: [http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB899](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB899)
- ❖ California Code of Regulations – Title 5: Article 4 School Facilities: <http://www.cde.ca.gov/ls/fa/sf/title5regs.asp>
- ❖ California Career Resource Network: <http://www.californiacareers.info/>
- ❖ California ELD Standards Resources: <http://www.cde.ca.gov/re/cc/eldresources.asp>
- ❖ California Preschool Learning Foundations: <http://www.cde.ca.gov/sp/cd/re/psfoundations.asp>
- ❖ California Science Curriculum Frameworks Web site: <http://www.cde.ca.gov/ci/sc/cf/>
- ❖ California Science Safety Handbook: <http://www.cde.ca.gov/pd/ca/sc/documents/scisafebk2012.pdf>
- ❖ Career Technical Education Model Curriculum (CTE) Standards: <http://www.cde.ca.gov/ci/ct/sf/ctemcstandards.asp>

- ❖ Common Core State Standards Web site: <http://www.cde.ca.gov/re/cc/>
- ❖ Family Engagement Framework, A Tool for California School Districts (2011): [http://www.wested.org/online\\_pubs/cpei/family-engagement-framework.pdf](http://www.wested.org/online_pubs/cpei/family-engagement-framework.pdf)
- ❖ Greatness By Design: Supporting Outstanding Teaching to Support a Golden State: <http://www.cde.ca.gov/eo/in/documents/greatnessfinal.pdf>
- ❖ Innovate - A Blueprint for Science, Technology, Engineering, and Mathematics in California Public Education: <http://www.cde.ca.gov/pd/ca/sc/documents/innovate.pdf>
- ❖ Next Generation Science Standards (NGSS) Web Site: <http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp>
- ❖ Professional Development Opportunity Search Form: <http://www.cde.ca.gov/pd/te/ce/prodev07intro.asp>
- ❖ Recommendations for Transitioning California to a Future Assessment System: <http://www.cde.ca.gov/ta/tg/sa/documents/suptrecriptjan13.pdf>
- ❖ SMARTER Balanced Assessment Consortium Web Page: <http://www.cde.ca.gov/ta/tg/sa/smarterbalanced.asp>
- ❖ Superintendent's Quality Professional Learning Standards: [http://cacompcenter.org/wp-content/uploads/2014/05/QPLS-Preview-Copy\\_052014.pdf](http://cacompcenter.org/wp-content/uploads/2014/05/QPLS-Preview-Copy_052014.pdf)

### **National Resources**

- ❖ Common Core State Standards Initiative Web Site: <http://www.corestandards.org/>
- ❖ Next Generation Science Standards (NGSS) Web Site: <http://www.nextgenscience.org/>
- ❖ SMARTER Balanced Assessment Consortium Web Site: <http://www.smarterbalanced.org/>
- ❖ Student Achievement Partners: <http://www.achievethecore.org/>

### **Organizations, Initiatives, and Web-Based Resources:**

- ❖ Association of California School Administrators: <http://www.acsa.org/>

- ❖ Achieve, Inc.: <http://achieve.org/>
- ❖ Brokers of Expertise: <http://www.myboe.org>
- ❖ California County Superintendents Educational Services Association: <http://ccsesa.org/>
- ❖ California School Boards Association: <http://www.csba.org/>
- ❖ California Science Teachers Association: <http://www.cascience.org/csta/csta.asp>
- ❖ California Science Project: <http://csmp.ucop.edu/csp>
- ❖ California State PTA: <http://www.capta.org/>
- ❖ California STEM Learning Network: <http://www.cslnet.org/>
- ❖ Change the Equation: <http://changetheequation.org/>
- ❖ Click2Science PD: <http://www.click2sciencepd.org/>
- ❖ K-12 Alliance/WestEd: <http://www.wested.org/project/k-12-alliance/>
- ❖ National Association for the Education of Young Children: <http://www.naeyc.org/>
- ❖ National Science Teachers Association: <http://www.nsta.org/>
- ❖ Performance Assessment Links in Science (PALS), National Science Education Standards: <http://pals.sri.com/>
- ❖ STEM<sup>2</sup> The Power of Discovery: <http://powerofdiscovery.org/>
- ❖ STEMx Sustainability Compass (rubric): <http://www.stemx.us/>
- ❖ The Coalition for Science Afterschool: <http://afterschoolscience.org/directory/>
- ❖ The Public Broadcasting System, Science and Nature: <http://www.pbs.org/topics/science-nature/>

## Articles, Books, and Research

- ❖ Achieve, Inc. (2014). Educators Evaluating Quality Instructional Products (EQIP) Rubric: <http://www.achieve.org/EQIP>
- ❖ Bybee, Roger W. (2013). Translating NGSS for Classroom Instruction: <http://learningcenter.nsta.org/files/PB341Xweb.pdf>
- ❖ Coggshall, Jane G. (2012). Toward the Effective Teaching of New College- and Career-Ready Standards: Making Professional Learning Systemic: <http://www.gtlcenter.org/sites/default/files/docs/TowardEffectiveTeaching.pdf>
- ❖ Council of the Great City Schools (2013). Communicating the Common Core State Standards, A Resource for Superintendents, School Board Members, and Public Relations Executives: <http://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/4/FINAL%20Communicating%20Common%20Core%202011.13.pdf>
- ❖ Hess, Jones, Carlock, and Walkup (2009). Cognitive Rigor: Blending the Strengths of Bloom's Taxonomy and Webb's Depth of Knowledge to Enhance Classroom-level Processes: [http://standardsco.com/PDF/Cognitive\\_Rigor\\_Paper.pdf](http://standardsco.com/PDF/Cognitive_Rigor_Paper.pdf)
- ❖ *INNOVATE A: Blueprint for Science, Technology, Engineering, and Mathematics in California Public Education*, (2014): <http://www.cde.ca.gov/eo/in/stemtf.asp>
- ❖ Loucks-Horsley, Love, Stiles, Mundry, and Hewson, (2003). *Designing Professional Development for Teachers of Science and Mathematics* Corwin, Thousand Oaks CA.
- ❖ National Research Council (2011) Successful K–12 Stem-Education: <http://www.stemreports.com/2011/nrc-publishes-successful-k-12-stem-education/>
- ❖ National Research Council. *Developing Assessments for the Next Generation Science Standards*. Washington, DC: The National Academies Press, 2013.
- ❖ Pratt, Harold (2012). *The NSTA Reader's Guide to A Framework for K–12 Science Education: Second Edition: Practices, Crosscutting Concepts, and Core Ideas*. NSTA Press.
- ❖ Reiser, Brian (2013). What Professional Development Strategies Are Needed for Successful Implementation for the Next Generation Science standards? <http://www.k12center.org/rsc/pdf/reiser.pdf>

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## Appendix C: Acronyms

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ACSA	Association California School Administrators
CCC	Crosscutting Concepts
CCSS	Common Core State Standards
CDE	California Department of Education
COE	County Office of Education
CSBA	California Board School Association
CSP	California Science Project
CSTA	California Science Teacher Association
CTC	California Commission on Teacher Credentialing
CTE	Career Technical Education
DCI	Disciplinary Core Ideas
ETS	Engineering and Technology Standards
ILP	Individual Learning Plan
LCAP	Local Control Accountability Plan
LCFF	Local Control Funding Formula
LEA	Local Educational Agency
NGSS	Next Generation Science Standards
PEM	Program Elements Matrix
PL	Professional Learning
PLC	Professional Learning Community
PLM	Professional Learning Module
RFA	Request For Application
SEP	Science and Engineering Practices
SQPLS	Superintendent's Quality Professional Learning Standards

## Appendix D: CA NGSS Initiatives of Stakeholder Organizations

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This section will be populated with current and planned initiatives of stakeholder organizations in support of NGSS awareness, transition, and implementation. This will include, but is not limited to:

- County Offices of Education Service Offerings – California County Superintendents Educational Services Association
- Professional Associations and Stakeholder Organizations
- Association of California School Administrators (ACSA)
- California Science Teachers Association (CSTA)
- K-12 Alliance/WestEd
- California Science Project – Science (CSP)
- California State Parent Teacher Association (PTA)