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The California Next Generation Science Standards

Professional Learning Support Division

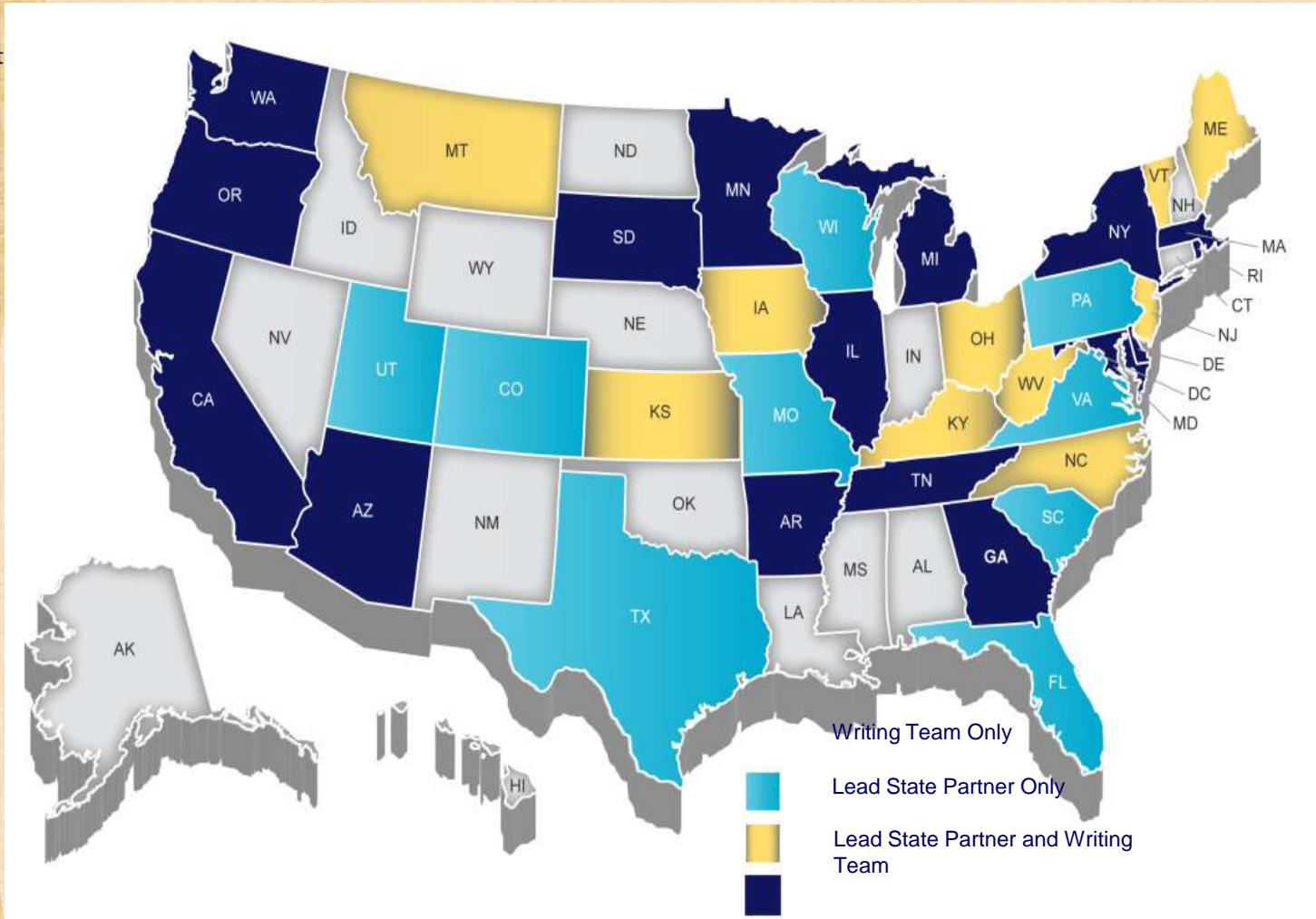
California Department of Education



Lead State Partners and NGSS Writing Team



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STATES ADOPTING NGSS

California	New Jersey
Delaware	Oregon
Kansas	Rhode Island
Kentucky	Vermont
Illinois	Washington
Maryland	West Virginia
Nevada	District of Columbia



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A Framework for K-12 Science Education

<http://www.nextgenscience.org/>



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Principles of the Framework



- Children are born investigators
- Understanding builds over time
- Science and engineering require both knowledge and practice
- Connecting to students' interests and experiences is essential
- Focusing on core ideas and practices
- Promoting equity



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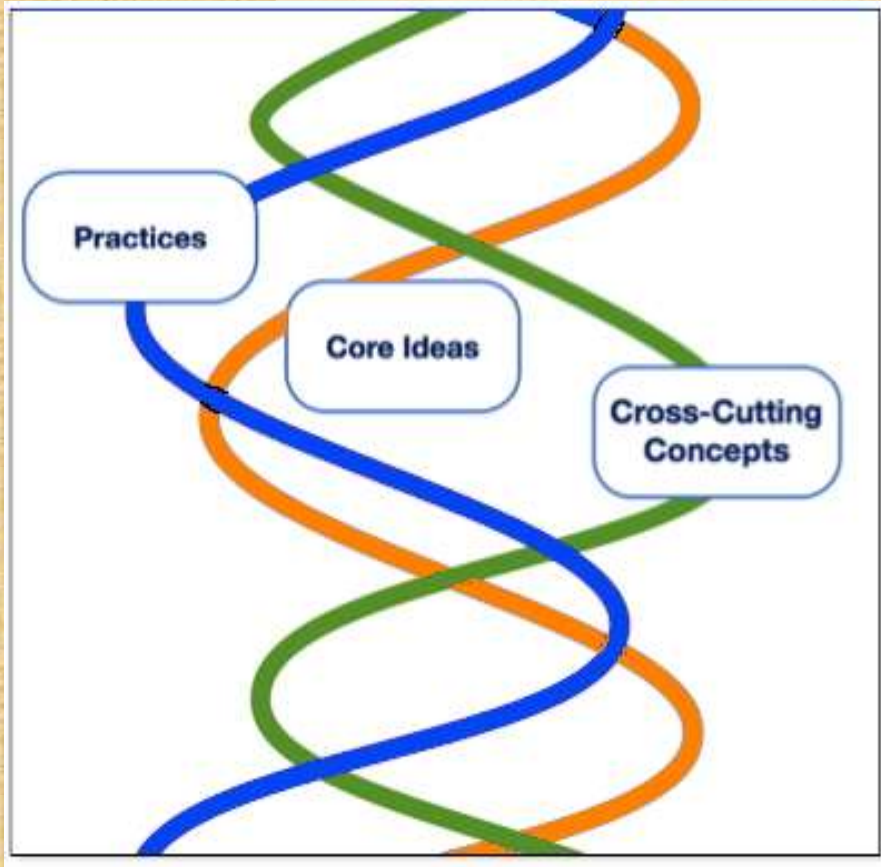


What's Different about the Next Generation Science Standards?



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Three Dimensions Intertwined



- Performance Expectations
- Requires contextual application of the three dimensions by students.
- Focus is on how and why as well as what



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The Three Dimensions



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Science & Engineering Practices



- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics, information and computer technology, and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information



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Crosscutting Concepts



- Patterns
- Cause and effect
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change



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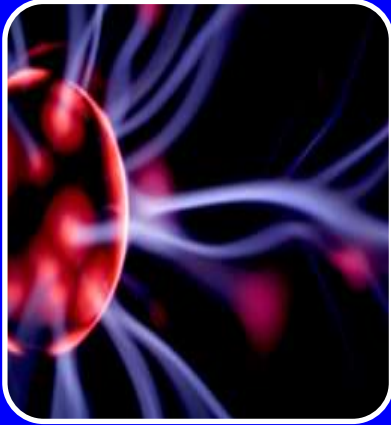
NEXT GENERATION
SCIENCE
STANDARDS

For States, By States



Disciplinary Core Ideas

Physical Science



- PS1: Matter and Its Interactions
- PS2: Motion and Stability: Forces and Interactions
- PS3: Energy
- PS4: Waves and Their Applications in Technologies for Information Transfer

Life Science



- LS1: From Molecules to Organisms: Structure and Processes
- LS2: Ecosystems: Interactions, Energy, and Dynamics
- LS3: Heredity: Inheritance and Variation of Traits
- LS4: Biological Evolution: Unity and Diversity



Earth and Space Science

- ESS1: Earth's Place in the Universe
- ESS2: Earth's Systems
- ESS3: Earth and Human Activity



Engineering, Technology, and Applications of Science

- ETS1: Engineering Design
- ETS2: Links Among Engineering, Technology, Science, and Society

1-LS1 From Molecules to Organisms: Structures and Processes

1-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*** [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]
- 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.** [Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*.

Science and Engineering Practices

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K-2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.

- Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information.

- Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (1-LS1-2)

Disciplinary Core Ideas

LS1.A: Structure and Function

- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

LS1.B: Growth and Development of Organisms

- Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)

LS1.D: Information Processing

- Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

Crosscutting Concepts

Patterns

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2)

Structure and Function

- The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

Connections to Engineering, Technology, and Applications of Science

Influence of Engineering, Technology, and Science on Society and the Natural World

- Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (1-LS1-1)

Connections to other DCIs in this grade-level: will be available on or before April 26, 2013.

Articulation of DCIs across grade-levels: will be available on or before April 26, 2013.

Common Core State Standards Connections: will be available on or before April 26, 2013.

ELA/Literacy -

Mathematics -



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CALIFORNIA NEXT GENERATION SCIENCE STANDARDS SYSTEMS IMPLEMENTATION PLAN



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The Plan Includes

- Three phases of implementation
 - Awareness
 - Transition
 - Implementation
- Timeline of significant events
- Suggestions and opportunities for
 - The California Department of Education (CDE)
 - Local Education Agencies (LEAs) and
 - Community Stakeholders and Support Providers
- 8 guiding strategies

<http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp>

CA Next Generation Science Standards Systems Implementation Timeline & Key Events

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

January–February 2014:
NGSS Framework Focus Groups and Public Comment

March–May, 2014:
Science Leadership Team develops State Implementation Plan for CA NGSS

September 4, 2013:
California SBE Adopts Next Generation Science Standards (NGSS)

July 2014:
Science Assessment Stakeholder Meetings Begin

March 2016:

Anticipated CDE Recommendations to the SBE on Science Assessments

2017:
Anticipated List of SBE-Adopted K–8 Science Instructional Materials Adoption

2018-19
Anticipated Administration of NGSS Science Assessments

2013

2014

2015

2016

2017

2018

2014–2018:
CA K-8 NGSS Early Implementation Initiative

2014–2016:
Revision of CA Science Curriculum Framework

April 2014–June 2017:
NGSS Awareness/Transition/Implementation Leadership Workshops & Webinars



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Guiding Strategies

1. Professional Learning
2. Instructional Resources
3. Assessment
4. Expanded Learning
5. Postsecondary and Business
6. Resources
7. Communication
8. Coalition Building



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Implementation Activities

- Professional Learning Workshops
 - Phase I is almost complete
 - San Diego: April 17-18 Univ. of San Diego
 - Ventura COE: June 1-2
 - Registration:
<http://www.iplanevents.com/ngssrollout>
 - Phase 2 is starting April 2015 with 9 workshops
 - First workshop in San Joaquin COE, April 27-28
 - Registration at <http://goo.gl/nxt8LX>
 - For other 8 workshops, Registration will be at the CCSESA website: <http://ccsesa.org>



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Implementation Activities

- NGSS Digital Center will be located on My Digital Chalkboard,
<https://www.mydigitalchalkboard.org/>
 - Resources for all Stakeholders
 - Updates
- Public Outreach
 - Develop products and tools for community support throughout implementation
 - Create and disseminate printed materials for community outreach
- Professional Learning Modules



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NGSS Leadership Coalition

- Stakeholder organizations, agencies, and support providers
- CDE Participates in liaison capacity
- Identify and prioritize NGSS issues and needs
- Ensure effective implementation of NGSS at state and local levels
- Advocacy for the support and resources needed for successful implementation



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Implementation Timeline (completed items)

- **September 4, 2013:** California State Board of Education (SBE) Adopts Next Generation Science Standards (NGSS)
- **November 6, 2013:** California SBE Adopts Preferred Integrated Model for Grades 6–8 and Authorizes Discipline Specific Model as Alternative for Grades 6–8
- **January – February 2014:** NGSS Framework Focus Groups and Public Comment
- **July 2014:** Science Assessment Stakeholder Meetings
- **November 2014:** NGSS Systems Implementation Plan for California adopted by SBE



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Implementation Timeline (future items)

- **2014–2018:** CA K-8 NGSS Early Implementation Initiative
- **2014–2016:** Revision of CA Science Curriculum Framework
 - **September 2016:** Framework Adoption
 - **2017:** Anticipated List of SBE-Adopted K–8 Science Instructional Materials Adoption
- **April 2014–June 2017:** NGSS Awareness/Transition/Implementation Leadership Workshops & Webinars
- **2016:** Anticipated CDE Recommendations to the State Board of Education (SBE) on Science Assessment
- **2018-19:** Anticipated Administration of NGSS Science Assessments (pilot test 2016-17, field test 2017-18, and operational testing 2018-19)



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For more information on the implementation of CA NGSS

- CA NGSS and NGSS Systems Implementation Plan- Professional Learning Support Division (PLSD)
 - Updated information at CDE NGSS Home Page:
<http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp>
- New Science Framework aligned to the CA NGSS- Curriculum and Frameworks & Instruction Resources (CFIR) Division
 - Updated information at <http://www.cde.ca.gov/ci/sc/cf/>
- New assessments aligned to the CA NGSS- Assessment Development & Administration Division (ADA) Division
 - Updated information at <http://www.cde.ca.gov/ta/tg/ca/>



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THANK YOU

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