



# Next Generation Science Standards State Application

## Development of the Next Generation Science Standards

The National Academies of Science, Achieve, the American Association for the Advancement of Science, and the National Science Teachers Association have embarked on a two-step process to develop the *Next Generation Science Standards* (NGSS). The first step of the process has been led by The National Academies of Science, a non-governmental organization commissioned in 1863 to advise the nation on scientific and engineering issues. The National Research Council (NRC), the functional staffing arm of the National Academies of Science, is developing the soon to be released *Conceptual Framework for Science Education*. Establishing the *Framework* is a critical first step because it will be grounded in the most current research on science and science learning and will identify the science all K–12 students should know. In step-two, managed by Achieve, states will lead the development of rigorous and internationally benchmarked science standards that will be faithful to the *Framework*. These *Next Generation Science Standards* will be developed through collaboration between states and other stakeholders in science, science education, higher education, and industry. Additional review and guidance will be provided by advisory boards composed of nationally-recognized leaders in science, science education and business and industry. As part of the development process, the standards will undergo multiple reviews from many stakeholders including two public drafts, allowing all who have a stake in science education an opportunity to inform the proposed content and organization of the standards. This process will produce a set of rigorous, high quality K–12 *Next Generation Science Standards* ready for state adoption.

## Directions

All applications must include the State Partnership Agreement with the signatures of the Chief State School Officer and State Board of Education Chair. States may choose to submit letters of support from key leaders/organizations.

The application questions will be used to select the cohort of states that will participate in the full development of the *Next Generation Science Standards* from the first draft. States who are able to leverage existing innovative science agenda and those poised to enrich the overall science education agenda will receive special consideration. While all states will have opportunity to provide feedback and guidance during the development process, this cohort of lead states will be engaged from the beginning to offer guidance to the writers and develop models that can be used by other states as they consider adoption and implementation of the new science standards.

## Submission Information

**States must submit their applications electronically no later than Friday, July 15, 2011.**

Applications should be submitted via email to [spruitt@achieve.org](mailto:spruitt@achieve.org)

Achieve is coordinating the application process. Please direct questions to Stephen Pruitt at 202-419-1540 or [spruitt@achieve.org](mailto:spruitt@achieve.org).

# State Partnership Agreement for the Development of the Next Generation Science Standards

Lead State partners agree to

- Give serious consideration to adopting the resulting *Next Generation Science Standards* as presented
- Participate in at least four Multi-State Action Committee meetings (Committee of the Chief State School Officers from each lead state partner) to discuss issues around adoption and implementation of the new standards. At least one will be done in person
- Participate in standards development process through SEA staff time
- Make public that your state is part of the effort to draft new science standards and make transparent the state's process for outreach/receiving feedback during the process
- Identify a state lead
- Form broad based committee that considers issues around adoption and provides input and reactions to three to five drafts. Each state may determine the overall makeup of their committee as well as the number of individuals on the committee. It is suggested that the following stakeholders are included:
  - State Science Supervisor (Recommended Facilitator)
  - State Assessment Specialist
  - K-12 educators: Elementary science teacher/specialist, Middle school science teacher/specialist, High school disciplinary science teacher/specialist (biology, chemistry, physics, earth/space), School-level administrator, District-level administrator, Special Education teacher/specialist, English language learner/acquisition teacher/specialist, Gifted/Talented education teacher/specialist, Career-Technology-Engineering teacher/specialist
  - Scientists (arts and sciences and science education faculty, and practicing scientists)
  - People who explain science to the public (e.g., museum and aquarium educators)
  - State Board Member
  - Governor's Education Policy Advisor
  - President of the state science teacher organization or their designee
  - STEM Council representative(s)
  - Business representative(s)
- Publicly identify timeline for adopting science standards

State partners will benefit by having

- A leadership role in the development of the NGSS
- On-line access to ongoing development work from the beginning of the process
- Support from Achieve in developing implementation and transition plans while the standards are being developed that can be used as models for other states

***The Next Generation Science Standards will identify a focused set of scientific concepts and key ideas, inquiry skills and scientific practices that all students should learn. To reap the benefits of the science standards, states should adopt them in whole, without alteration. As they will not define a detailed curriculum, states and local districts will have the opportunity and responsibility for providing more detailed guidance to classroom teachers, and will have room to fill in specific content and topics that will help students learn the key concepts in the standards.***

Chief State School Officer \_\_\_\_\_

State Board Chair \_\_\_\_\_

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<b>I. Contact Information.</b>	
A. State	Oklahoma
B. Describe the state's current science standards' structure (i.e. grade by grade/grade band) and the current grades in which science is assessed. Describe any changes being considered to this structure. What role do districts play in determining the grade by grade content for science?	Oklahoma's standards are structured by grade level (K-8) and by subject area (9-12). Currently Oklahoma assesses students in science in grades 5 and 8 in addition to the Biology End-of-Instruction test (usually taken during 9 <sup>th</sup> or 10 <sup>th</sup> grade). There are currently no changes being considered to this structure.
<b>II. Commitment to Quality Science Education</b>	
A. How well is your state positioned to adopt the <i>Next Generation Science Standards</i> ? In responding, please consider leadership, budget, opportunity/planned events, public will, political will, and state capacity.	Oklahoma is positioned as well as any other state. We have a strong political will for adopting the <i>Next Generation Science Standards</i> . Over the last year, there have been many changes in leadership, both within the state agency and without, and momentum for education reform is strong. Oklahoma is currently a member of the PARCC governing board and our chief school officer is heavily involved in affecting reform throughout the curriculum.
B. Where is your state in its science adoption cycle? What entity is responsible for approving new state standards? What would be the adoption timeline?	<p>Oklahoma adopted the new Science Priority Assessment Student Skills (PASS) in March of 2011 and the revisions were approved by the legislature and the governor in June 2011.</p> <p>In Oklahoma, the State Department of Education is tasked with designing the standards. The state board of education, the legislature, and the governor must approve the state standards.</p> <p>Oklahoma would consider adoption of the state standards as soon as a final draft is approved. Once adopted, Oklahoma would begin an immediate transition to the new standards, with an assessment of those standards in place within two years.</p>
C. Why are you applying to be a lead state in the NGSS development? How would your state's participation in the development of the <i>Next Generation Science Standards</i> help to accomplish your state's science education policy agenda? Describe how participation in the NGSS will complement and expedite other on-going science education efforts in your state.	<p>Oklahoma is emerging as a leader in education reform. We recognize the value of common standards and assessments across the curriculum. If we are going to measure ourselves honestly against other states, we know the only way to do that is to use a common assessment. We would like to have a say in what is included in the standards. We have a strong interest specifically in science and engineering due to our involvement in oil and gas industry, a strong bio-medical sector, and an emerging interest in alternative energy resources, e.g. wind energy.</p> <p>The Oklahoma Business and Education Coalition is already in place. This organization is an advocate of education reform, with a large measure of their agenda centering on a push for more rigorous math and science standards. The coalition has already been successful in instituting measures to improve student achievement, such as Achieving Classroom Excellence.</p>

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	<p>Oklahoma has already adopted the Common Core Standards and is a governing PARCC state. We want to extend that progress to science as well and build on the momentum already achieved through the adoption of the Common Core State Standards.</p> <p>In the past, Oklahoma has been a leader in the area of Next Generation Science Standards. Jana Rowland, the previous science director, was an advocate for NGSS and worked closely with members of Achieve in the initiative. Because of the leadership transition, we were unable to apply by the deadline of July 15, 2011. However, we intend to continue the work already begun on NGSS. Our State Science director is involved with the Council of State Science Supervisors and is working to increase his knowledge of this initiative.</p> <p>Oklahoma is in the beginning stages of developing a state-wide STEM plan. Our participation in NGSS could serve to further strengthen this measure. It would show STEM stakeholders that their education leadership is interested in growing science education in the state.</p>
<p><b>OPTIONAL</b> – Do you have a sense of urgency for science standards due to state mandates, planned events, or activities already in progress?</p>	<p>There is a sense of urgency in the same way everyone has an urgency to adopt common science standards. With the advent and subsequent adoption of the Common Core State Standards, science is the likely candidate for the next round of common standards. Oklahoma is looking for the same kind of increased rigor and new process skills, e.g. engineering, that are reflected in our newly-adopted state standards.</p> <p>Because of the adoption of the Common Core, there is a momentum for standards-reform. This momentum is an opportunity and Oklahoma wants to take advantage of it.</p>
<p><b>III. State’s Unique Contributions</b></p>	
<p>A. What emerging state policies or initiatives in science or STEM education could be models for other states?</p>	<p>Our Superintendent of Public Instruction has unveiled the 3R agenda. This agenda contains three components: rethink, restructure, and reform. The agenda aims to make every student in the State of Oklahoma College, Career, and Citizen ready. The legs on which this agenda stands are literacy and STEM. This idea has even impacted the structure of our agency. Within the Office of Instruction, there is a section devoted entirely to STEM, which includes an Executive Director, the Director of Mathematics, and the Director of Science. This restructure is indicative of the vision and mission of the agency to increase achievement in STEM.</p>
<p><b>IV. Alliances and Infrastructure for Successful Adoption and Implementation</b></p>	
<p>A. What alliances or infrastructures (i.e., STEM Council or Network, or Business Alliance) are in place in your state to enable communication, collaboration, and feedback for the standards while in development? What unique value would this structure offer during adoption and implementation?</p>	<p>Oklahoma has two things in place that could enable communication, collaboration, and feedback for the standards during development: The Oklahoma Science Teachers Association (OSTA) and the Oklahoma Business and Education Coalition (OBEC). Both organizations offer expertise and insight into the needs of a highly-trained workforce. The OSTA brings expertise of pedagogy (implementation) and the OEBC has the network and political will in place to affect the change needed in the state.</p>

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	<p>By bringing these two organizations together, we can build a coalition of stakeholders of NGSS. Both organizations realize the importance of strong science education. Since the standards drive instruction, they both have a vested interest in what eventually will be in those standards and how that will be assessed.</p> <p>OSTA has at the heart of its mission to “promote excellence and innovation in science teaching.” They are concerned with what students know and how they know it. As an organization of teachers, their mission is student centered, but they recognize that the educators cannot do it alone. There must be others to support the mission of a group of college and career ready graduates.</p> <p>OBEC has as its mission statement to “Make Oklahoma a leader in public education.” One of the ways to facilitate this is through rigorous standards. From their website: “A successful system clearly defines expectations for student success in school, in the workplace, and in life. Our graduates must be prepared to compete with job applicants from around the world. We must be certain our standards are high compared against the best education systems in the nation and world.” Clearly, they believe the heart of a strong science education lies in the standards and those standards must allow us to compare ourselves to the rest of the nation. That is direct support of Next Generation Science Standards.</p> <p>Additionally, the K20 Alt Center at the University of Oklahoma is a partner with the Oklahoma State Department of Education in increasing student achievement in science. This coalition holds professional development for teachers to enable explicit connections between math and science. Their partnership will fold directly in to the adoption of science standards with the existing Common Core mathematics standards.</p> <p>Oklahoma has a strong State Career-Tech infrastructure in place to support the efforts of a career ready workforce, especially in the area of science.</p> <p>Finally, our agency has recently launched the REACH Network, a group of school districts that will lead the implementation of Common Core Standards. The vision for this group is to have them become a broad advisory network. They will be instrumental in assisting in any new initiatives, such as NGSS.</p>
<p>B. Identify in-state experts outside of your leadership team and working team who are uniquely qualified and would be willing to act as a resource to support adoption and implementation.</p>	<p>K20 Alt Center  REACH Network  Oklahoma Regents for Higher Education  Oklahoma Center for the Advancement of Science and Technology</p>
<p>C. What additional types of policy expertise and support would best complement your state’s efforts in adopting and/or implementing the NGSS?</p>	<p>The support needed by Oklahoma is in the matter of wording the concept of “change over time.” This issue could be a deciding factor in adoption of the standards, as it will likely be in many other states. The “change over time” concept is addressed by our current state standards and we hope it will be carefully considered during the development of the Next Generation Science Standards.</p>

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V. State Leadership Team	
<p>A. Please provide the names of your state's leadership team. States are encouraged to consider including individuals as outlined in the State Partnership Agreement (page 2 of this application). <i>Please include each person's name, title and organization or agency.</i></p>	<ol style="list-style-type: none"> <li>1. Jody Bowie, Science Director, Oklahoma State Department of Education</li> <li>2. Gaile Loving, Assessment Specialist, Oklahoma State Department of Education</li> <li>3. Jeff Patterson, Science Curriculum Director, Norman Public Schools</li> <li>4. Bob Melton, Science Curriculum Director/Assessment Specialist, Putnam City Schools</li> <li>5. Terry Sackett, Science Curriculum Director, Enid Public Schools</li> <li>6. Tiffany Neill, Science specialist, K20 Alt Center, University of Oklahoma</li> <li>7. Tina Rogers, Science Teacher, Canton High School</li> <li>8. Jim Jenkins, Science Teacher, Bethel High School</li> <li>9. Joyce Cheatham, Science Teacher, Pawnee Middle School</li> <li>10. Becky Hammack, Science Teacher, Stillwater Middle School</li> <li>11. Annette Huett, Teacher, Kelly Elementary, Moore Public Schools</li> <li>12. Tammy Bennett, Science Teacher, Duncan Middle School</li> <li>13. Lisa Steadman, Science Teacher, Woodward Middle School</li> <li>14. Diana Lebsack, Principal, Capps Middle School, Putnam City Schools</li> <li>15. Cindy Watson, Asst. Principal, Roosevelt Elementary School, Norman Public Schools</li> <li>16. Kay Gamble, Science Department Chair, Ada High School, Ada Public Schools</li> <li>17. Jana Rowland, Instructor, Biomedical Instructor, Western Technology Center</li> <li>18. Jennie Croslin, Chemistry Instructor, Francis Tuttle Vo-Tech</li> <li>19. Dr. Steven Maier, Chair, Dept. of Natural Science, Northwestern Oklahoma State University</li> <li>20. Dr. Mark Winslow, Assoc. Professor of Physics, Director of Science Education, Southern Nazarene University</li> <li>21. Dr. Robbie McCarty, Assoc. Professor of Physical Science, Southwestern Oklahoma State University</li> <li>22. Dr. Beth Allen, President, Oklahoma Science Teachers Association, Professor of Biological Science, University of Central Oklahoma</li> <li>23. Dr. Richard Broughton, Assoc. Professor of Zoology, University of Oklahoma</li> <li>24. Dr. Mark Morvant, Assoc. Professor of Chemistry, University of Oklahoma</li> <li>25. Dr. Don French, Professor of Zoology, Oklahoma State University</li> <li>26. Dr. John Gelder, Professor of Chemistry, Oklahoma State University</li> <li>27. Sherry Marshall, Director, Oklahoma Museum Network at Science Museum of Oklahoma</li> <li>28. Dr. Phyllis Hudecki, Secretary of Education, State of Oklahoma</li> <li>29. Dr. Steven McKeever, Secretary of Science and Technology, State of Oklahoma</li> <li>30. Designated representative of Chesapeake Energy Corporation</li> <li>31. Designated representative of Devon Energy Corporation</li> <li>32. Representative Jason Nelson, Oklahoma State House of Representatives</li> <li>33. Dr. Debra Stuart, Oklahoma Regents for Higher Education</li> </ol>

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<p>B. Identify the team-lead and describe how this person is positioned to successfully lead your state team in the NGSS development process. How will this person support the adoption and implementation of the NGSS?</p>	<p>Jody Bowie, the Science Director for the Oklahoma State Department of Education, will be the team lead for this initiative. Mr. Bowie is new in the agency, but brings classroom experience and innovative ideas with him. He is an innovator and a strong proponent of integrating cross-curriculum projects into the science classroom.</p> <p>Jody sees the immediate need to continue the momentum started by the Common Core adoption in Oklahoma. He feels there is a need for Oklahoma to adopt State Science Standards because of the lack of preparation he saw in his own students, upon arriving in the physics classroom. He experienced firsthand the lack of ability of students to think critically about ideas. Jody worked to increase rigor and evidentiary argument in his classroom. These ideas will be central to the Next Generation Science Standards.</p>
<b>VI. Optional Information</b>	
<p>Please provide any additional information that you would like the selection committee to consider.</p>	<p>Oklahoma is submitting this application late because of the gap in leadership in the position of Science Director.</p>