# 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

Achieve is coordinating the application process. Please direct questions to Stephen Pruitt at 202-419-1540 or 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 <u>not</u> 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 Dr. John D. Barge John Barge

State Board Chair Mrs. Wanda Barrs Wanda Barrs

# Next Generation Science Standards State Application

# Application

| I. Contact Information. | |
|---|---|
| A. State | Georgia |
| 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? | The Georgia Performance Standards (GPS) for science are designed to provide students with the knowledge (what students should know) and skills (what students should be able to do) for proficiency in science. The philosophical basis of the GPS in science is founded on the National Science Education Standards and Project 2061, the Benchmarks for Science Literacy. Even though the Science GPS are structured in grade bands K-2, 3-5, 6-8, and 9-12, there are specific standards for each K-8 grade and 9-12 courses. The GPS is assessed in grades 3-8 through the Criterion-Referenced Competency Tests (CRCT) and in high school through End of Course Tests in biology and physical science.<br>The Georgia Performance Standards set a lower limit on what teachers should teach and an upper limit on what is assessed at each grade level. Georgia's schools districts use the GPS as guidance to determine the minimum science content knowledge and skills that students must have at each grade level, but they may determine additional content based on the needs and characteristics of their individual student populations. |
| **II. Commitment to Quality Science Education** | |
| A. How well is your state positioned to adopt the *Next Generation Science Standards*? In responding, please consider leadership, budget, opportunity/planned events, public will, political will, and state capacity. | Georgia's State Superintendent, Dr. John Barge, has made it a priority to provide Georgia students with the tools and skills needed for successful transition into college and the work force. Georgia's curriculum in Mathematics and English Language Arts is already aligned to the Common Core State Standards. Initial steps are being taken to review the Science Georgia Performance Standards (GPS) to review and align them with the most recent research in the area of K-12 science education.<br>Three years ago, to emphasize the importance of science education, Georgia increased the number of science credits required for graduation from three to four and set clearer guidance on the science courses that students must take in order to satisfy these requirements. Furthermore, recognizing that science education is a K-12 process, Georgia will require that all elementary and middle schools use science as their second indicator for Adequate Yearly Progress (AYP) purposes beginning with a "hold harmless" year in the 2011-2012 school year with full implementation in the 2012-2013 school year. The Georgia Department of Education science and Career, Technical and Agricultural Education (CTAE) staff continues to collaborate to strengthen the science content in appropriate pathway courses. Many of these courses are accepted by the University System of Georgia as one of the four science credits required for high school graduation.<br>Recognizing the importance of industry in the overall development of the state, the Georgia Department of Education through its STEM initiatives, supports the work of schools in developing STEM programs aimed at increasing student interest in the areas of mathematics, science, engineering, and technology, as well as opening the doors for a stronger partnership between business and industry. |

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| II. Commitment to Quality Science Education (continuation) | |
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| 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? | Georgia Performance Standards are revised every four years in compliance with Georgia code 20-2-141. The next revision of the Science Georgia Performance Standards (GPS) will be consistent with the timeline for the release of the Next Generation Science Standards. Once the revision of the science GPS is complete, the revised standards will be submitted to the State Board of Education for review and approval. The revision and adoption of the science Georgia Performance Standards will follow the timeline described in Appendix A of this application.<br><br>Based on Georgia codes 20-2- 1010 through 20-2-1015, the Georgia Learning Resources/Instructional Materials adoption cycle process is established. New K-12 science learning resources and instructional materials are scheduled for adoption during the 2013-2014 school year. |
| 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 *Next Generation Science Standards* 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. | Georgia is well positioned to be a lead state since Georgia's K-12 science standards are already strongly aligned to the National Science Education Standards (NGSS). Strong legislative support and close partnerships with other state education agencies will provide the structure necessary to implement instructional changes that may result from the adoption of the NGSS. This collaborative model, proven successful during our transition to the Georgia Performance Standards (GPS), can be easily replicated by other states.<br><br>Georgia's participation in the development of NGSS supports Georgia's vision to prepare students to compete nationally and internationally. As a result of participation in the development of the NGSS, Georgia's science standards will be aligned to international benchmarks thus allowing students to be competitive in the international marketplace.<br><br>Georgia has made an intentional decision to delay the revision of Georgia Performance Standards (GPS) until the NGSS are completed. This will provide Georgia an opportunity to better align the GPS for science to the NGSS and to prevent multiple revisions to the GPS in a short period of time. By maintaining the current set of science standards until the NGSS are released, Georgia's science assessments will only need to be changed once. This will allow for an easy transition to new assessments. |
| **OPTIONAL** – Do you have a sense of urgency for science standards due to state mandates, planned events, or activities already in progress? | |

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| III. State's Unique Contributions | |
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| A. What emerging state policies or initiatives in science or STEM education could be models for other states? | During the past several years, policy changes in Georgia have placed an increased focus on science curriculum and instruction. In 2008, Georgia increased the number of science credits required for graduation from three to four and set clearer guidance on the science courses that students must take in order to satisfy these requirements. The most recent policy change, designed to stimulate STEM and science instruction in elementary and middle schools, was the requirement that all elementary and middle schools make science their second indicator for Adequate Yearly Progress (AYP) purposes. This policy change will begin with a "hold harmless" year in 2011-2012, with full implementation in the 2012-2013 school year.<br><br>Two other initiatives, when implemented, that will have a positive effect in all areas that encompass STEM education are: 1) the College and Career Ready Performance Index and 2) the STEM State School Designation. The College and Career Ready Performance Index is a tool designed to provide a clear picture of the level of achievement required for a student to enroll in two or four year post-secondary institutions without remediation and to establish a progress model for schools to set target goals for student success in college and the workplace. The STEM School Designation is designed to recognize schools and school programs that focus daily instruction around a STEM idea. These schools will then serve as "hubs of innovation" in which engineering design processes are used to engage student learning. |
| **IV. Alliances and Infrastructure for Successful Adoption and Implementation** | |
| 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? | Georgia's education system includes critical alliances and partnerships. These groups make policy recommendations and work towards achieving Georgia's education priorities by coordinating and strengthening Georgia's P-20 education system, increasing the efficiency and impact of education policies, funding priorities to create a seamless education system, and highlighting the critical role of education in workforce development and economic recovery. At the highest level, Georgia's Alliance of Education Agency Heads (AEAH), which includes representation from the Georgia Department of Education (GaDOE), the Board of Regents of the University System of Georgia, the Technical College System of Georgia, the Department of Early Care and Learning, Georgia Professional Standards Commission, Georgia Student Finance Commission, and the Governor's Office of Student Achievement, meet regularly to review and develop education policy.<br>At the regional level, Georgia's 16 Regional Education Service Agencies (RESAs) provide communication, training, and support to public school districts in collaboration with the GaDOE. The GaDOE maintains close communication with the Georgia Science Teachers' Association (GSTA), Georgia Science Supervisors' Association (GSSA), and Georgia Youth Science Technology Centers (GYSTCs). Georgia Public Broadcasting (GPB) serves as a collaborative partner that provides training resources and dissemination of critical information related to the implementation of science standards and frameworks.<br>The Georgia Science Education Advisory Committee, which consists of teachers, higher education professors, business, industry, and informal education stakeholders, meets on a bi-monthly basis to provide feedback to the Department of Education regarding standards, curriculum, and policy.<br><br>This strong network reaches across Georgia and provides a collaborative environment for ongoing communication and feedback. |

| IV. Alliances and Infrastructure for Successful Adoption and Implementation (continuation) | |
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| 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. | **Kenneth Mason -Fifth Congressional District**<br>**Georgia Board of Education**<br>Mr. Mason is director of Urban Initiatives for the Southern Regional Education Board. He is a founding board member and advisory council chair for KIPP Strive Academy and teaches high school students on a civil rights emergent experience called Sojourn to the Past. Mr. Mason has also been a community liaison and robotic engineering consultant for Berkeley National Laboratory and served as a corps member adviser for Teach For America. Mason earned a bachelor's of Science degree from Hendrix College and a master's of Teaching/Education degree from the University of San Francisco.<br><br>**Amy Carter**<br>**Georgia State Representative**<br>A career educator, Amy is the Teaching as a Profession Teacher and a Work-Based Learning Coordinator for Lowndes High School. She prepares high school juniors and seniors for future positions in the field of education. Her students study, apply, and practice the use of current technologies, effective teaching and learning strategies, the creation of an effective learning environment, the creation of instructional opportunities for diverse learners and students with special needs, and plan instruction based on knowledge of subject matter, students, community, and curriculum performance standards. Through a partnership with local businesses, she also prepares students for the challenges they will face in the working world. Before working with high school students, Amy was a Business & Office Technology instructor at Valdosta Technical College. Her experience working with students has given Amy an understanding of the needs and challenges facing our educational system.<br><br>**Dr. Sheila Jones**<br>**Executive Director for Innovation and Policy with the Board of Regents of the University System of Georgia**<br>The University System of Georgia's Educator Preparation, Innovation and Research leads and coordinates the System's production and development of K-12 teachers, counselors, and leaders; and leads and coordinates college access and completion projects and initiatives. Dr. Jones recently served as the Principal Investigator and Project Director for Georgia's Partnership for Reform in Science and Mathematics (PRISM: 2003-2010) project funded by the National Science Foundation's Math Science Partnership Program. Dr. Jones is currently serving as the Project Director for the Near Peer Grant Program funded through the System's College Access Challenge Grant sponsored by the USDOE. |

| IV. Alliances and Infrastructure for Successful Adoption and Implementation (continuation) | |
|---|---|
| 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. | **Dr. Richard Millman**<br>**Director of the Center for Education Integrating Science, Mathematics, and Computing (CEISMC)**<br>Dr. Millman has been the Director of the Center for Education Integrating Science, Mathematics & Computing (CEISMC) and Professor of Mathematics at the Georgia Institute of Technology since August of 2008. He is the PI on the DRK12 grant from NSF, "Science Learning: Integrating Design, Engineering, and Robotics" (SLIDER) and on the subaward, STEM Professional Development, in Georgia's Race to the Top project. CEISMC is the STEM outreach group at Georgia Tech and presently has 39 staff members including teachers in all of the STEM disciplines.<br><br>**Dr. Brian Gerbes**<br>**Director of Curriculum, Instruction and Outreach**<br>**Valdosta State University -Dewar College of Education**<br>Dr. Gerbes has BS degrees in biology and secondary education and an MA in biology from Kent State University. He earned his Ph.D. in science education from the University of Oklahoma and has taught science at the high school level for 4 years. Brian started at Valdosta State University (VSU) in 1996 as an assistant professor of science education. He is currently the Director of Curriculum, Instruction and Outreach for the Dewar College of Education at VSU in Valdosta, Georgia.<br><br>**Dr. Frank Butler**<br>**Executive Director Georgia Youth Science and Technology Centers (GYSTC)**<br>Dr. Butler has served on several STEM-oriented, statewide task forces and committees, mostly sponsored by state agencies or private foundations that worked on ways to strengthen the STEM curriculums, extend access, and generate enthusiasm for science and mathematics among K-12 students. Dr. Butler lead a task force to design the curriculum for and propose to the Georgia General Assembly the construction of a Science/Math charter middle school to use aviation as a vehicle to stimulate interest in science and math primarily for middle school women and other underrepresented students. Dr. Butler has represented the State of Georgia on national panels to design and set standards for high school graduation under an initiative commissioned by the National Governors Association and managed *ACHIEVE.*<br><br>**Juarez Jackson**<br>**Software Engineering**<br>**Lockheed-Martin Aeronautics Company**<br>Mr. Jackson is a Dwight D. Eisenhower Fellowship recipient for his ideas in transportation. He graduated Magna Cum Laude from the Honors College at Benedict College with a degree in Computer Science. He holds a Masters degree in Aeronautical Science from Embry-Riddle Aeronautical University. He is a recipient of multiple Presidential Volunteer Awards and currently works as a Senior Embedded Software Engineer for Lockheed Martin Aeronautics where he graduated from the Engineering Leadership Development Program. He is involved in Partners in Education, Space Day, Engineers week, and Engineers in the classroom among other activities through Lockheed Martin Aeronautics. Juarez also serves as a mentor for the 100 scholars FIRST robotics team in the Atlanta area. |

| IV. Alliances and Infrastructure for Successful Adoption and Implementation (continuation) | |
|---|---|
| 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. | **Dr. Thomas Koballa Jr.**<br>**Dean and Professor College of Education**<br>**Georgia Southern University**<br>Dr. Koballa has been Dean and Professor of the Georgia Southern University College of Education for the last two years. Previously Dr. Koballa was a professor and Department Head of the Science Education department at the University of Georgia. Dr. Koballa has been board member of the Georgia Science Teacher Association, the national Association for Research in Science Teaching, and the National Science Teacher Association.<br><br>**Melissa Fincher**<br>**Associate Superintendent, Assessment and Accountability**<br>**Georgia Department of Education**<br><br>**Kim Morris-Zarneke**<br>**Manager of Education Programs**<br>**The Georgia Aquarium**<br>Mrs. Morris-Zarneke is the Manager of Education Programs for Georgia Aquarium and responsible for curriculum development, school partnerships, professional development, and assessment. Kim has a Bachelor of Science degree in Biology and Minor in Environmental Science from State University of New York at Geneseo and a Master of Science in Biology-Aquarium Science from the University of Maryland. In addition she has taken continuing education course in conservation education and has received a certificate in Distance Learning and Environmental Education.<br><br>**Daren Mallard**<br>**Manager –Worldwide Business Development**<br>**CISCO**<br>Mr. Mallard has been the Worldwide Business Development manager for Cisco Systems since 2005. Previously, Mr. Mallard worked with Scientific Atlanta as a Senior Financial Analyst and Investor Relations manager. |

| IV. Alliances and Infrastructure for Successful Adoption and Implementation (continuation) | |
|---|---|
| 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. | **Michael Robinson**<br>**Executive Director – Education Collaborative**<br>**Technology Association of Georgia (TAG)**<br>Michael Robertson joined TAG Ed in November 2010 and serves as Executive Director. In this role, he works with TAG Member companies to support and promote Science, Technology, Engineering and Math (STEM) programs to today's students, the workforce of tomorrow. Prior to joining TAG, Mr. Robertson helped build bridges between businesses and education in a variety of volunteer roles. While serving as chair of the Advisory Board of the GIFT (Georgia Industrial Fellowship for Teachers) Program at Georgia Institute of Technology, which offers summer fellowships to Georgia teachers, he was instrumental in expanding placements to over 100 teachers throughout Georgia. He has also served as a member of the Peachtree Executive Advisory Board for FIRST, which aspires to make science, math, engineering, and technology as cool for kids as sports are today. Professionally, Robertson spent the past 16 years at EMS Technologies, Inc. where he provided strategic oversight and direction as that company grew from 400 to 2,000 employees.<br><br>**Denise Koo**<br>**Director of Science Education and Professional Development Program Office**<br>**Center for Disease Control and Prevention (CDC)**<br>Dr. Koo graduated from Harvard University in 1984 with a B.A. in biochemical sciences. After combining medical school at the University of California, San Francisco, with an M.P.H. in epidemiology at University of California, Berkeley. Dr. Koo served as a preventive medicine resident in CDC's Foodborne and Diarrheal Diseases Branch. She then took a job as chief of the CDC branch responsible for operation of the National Notifiable Diseases Surveillance System, in the Division of Public Health Surveillance and Informatics, in 1994. Dr. Koo became director of this same division, in the Epidemiology Program Office (EPO), three years later, in 1997. In 2001, Dr. Koo became the EPO Associate Director for Science. In this position the CDC Director also tasked her with responsibility for CDC implementation of the Health Insurance Portability and Accountability Act Privacy Rule. |

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| IV. Alliances and Infrastructure for Successful Adoption and Implementation (continuation) | |
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| C. What additional types of policy expertise and support would best complement your state's efforts in adopting and/or implementing the NGSS? | Georgia is currently a member of two important consortiums under the Council of Chief State School Officers (CCSSO); the Science State Collaborative on Assessment and Student Standards and the Survey of Enacted Curriculum (SEC). Through its participation in these two groups, Georgia seeks to work with other states to develop best practices that will facilitate the adoption and implementation of the Next Generation of Science Standards. Furthermore, through the collaboration with other states, Georgia will work to develop assessment tools that will help teachers to assess student progress and learning. |
| **V. State Leadership Team** | |
| 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). *Please include each person's name, title and organization or agency.* | See Appendix B for a complete list of the state's science leadership team. |
| 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? | Dr. Juan-Carlos Aguilar will lead Georgia's efforts on this initiative. Dr. Aguilar is the Science Program Manager at the Georgia Department of Education. He oversees the implementation of the state science curriculum, the alignment of the state assessments to the Georgia Performance Standards, coordination of the state K-12 STEM initiative, and serves as liaison between the Department of Education and State and National science organizations.<br><br>Dr. Aguilar currently sits on the Board of the Council of State Science Supervisors. He is the Principal Investigator on the Georgians Experience Astronomy Research in the Classroom grant funded by NASA and Co-Principal Investigator on the Science Learning: Integrating Design, Engineering and Robotics (SLIDER) grant funded by NSF. |
| **VI. Optional Information** | |
| Please provide any additional information that you would like the selection committee to consider. | See Appendix B for a complete list of the Science Education Advisory Committee.<br>See Appendix C for letter of support. |

# Next Generation Science Standards State Application

Appendix A

**Georgia's Timeline for Revision, Adoption, and Implementation of the Next Generation Science Standards**

| Date | Activity | Participants |
|---|---|---|
| December-12 | The Next Generation National Science Standards are released | |
| December-12 | Formation of precision review groups to align science Georgia Performance Standards with new National Science Standards | **Twelve** K-8 Teachers (four teachers for each band; K-2, 3-5, and 6-8)<br>**Eighteen** High School Teachers (three for each core are; biology, physical science, physics, chemistry, environmental science, earth science)<br>**Ten** District Science Supervisors<br>**Ten** Higher Education Professors from the College of Arts and Science<br>**Ten** Higher Education Professors from the College of Education<br>**Ten** other members (includes representatives of non-traditional education institutions and industry representatives) |
| Jan-13 | Precision review group meets to write a first draft of the new science GPS aligned to the National Science Standards | **Twelve** K-8 Teachers (four teachers for each band; K-2, 3-5, and 6-8)<br>**Eighteen** High School Teachers (three for each core are; biology, physical science, physics, chemistry, environmental science, earth science)<br>**Ten** District Science Supervisors<br>**Ten** Higher Education Professors from the College of Arts and Science<br>**Ten** Higher Education Professors from the College of Education<br>**Ten** other members (includes representatives of non-traditional education institutions and industry representatives) |
| April-13 | Permission is asked to the Georgia Board of Education to post for public feedback the draft of the revised science GPS aligned to the Next Generation of Science Standards | Georgia Department of Education curriculum staff. |
| April-13 | Revised new science GPS is release for public feedback | All Georgia stakeholders |
| April-13 | New GPS aligned to the Next Generation National Science Standards is shared to with all teachers via the state Learning Managing System (LMS) | All science teachers in Georgia |
| June-13 | Adoption year for new instructional materials for science begins | Science Teachers |

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| Date | Activity | Participants |
|---|---|---|
| July-13 | Precision review group meets to review public feedback and make adjustments to the revised science GPS based on public comment as appropriate | **Twelve** K-8 Teachers (four teachers for each band; K-2, 3-5, and 6-8)<br>**Eighteen** High School Teachers (three for each core are; biology, physical science, physics, chemistry, environmental science, earth science)<br>**Ten** District Science Supervisors<br>**Ten** Higher Education Professors from the College of Arts and Science<br>**Ten** Higher Education Professors from the College of Education<br>**Ten** other members (includes representatives of non-traditional education institutions and industry representatives) |
| September-13 | Revised new science GPS is submitted to the Board for adoption as item for information | Georgia Department of Education curriculum staff |
| October-13 | Content specific groups meet to review GPS standards for all other high school science courses and align them to the revised science GPS | **Three** teachers for each specific science course<br>**Two** Higher Education professors (at least one of them from the College or Arts and Science)<br>**One** representative from a related industry |
| November-13 | Blueprints for biology and physical science EOCTs, 3-8 grades CRCT, GHSGT (if necessary) are revised to align to the newly adopted science GPS | Science Teachers |
| November-13 | Form review committees to revise alignment of science standards in Career Technical Agricultural Education (CTAE) courses beginning with those courses already approved as a fourth science option | Science and CTAE Teachers |
| December-13 | Revised new science GPS for all other high school science courses is submitted to the Board for adoption as action item. | Georgia Department of Education curriculum staff |
| December-13 | Revised GPS for all other science courses is posted for public feedback | Georgia Department of Education curriculum staff |
| December-13 | Draft of the blueprint to create a EOCT for physics and possible one for chemistry | Science Teachers |
| January-14 | Information meeting with all science district coordinators and RESA, GYSTC, and ETC personnel on changes to the science GPS | Science Program Manager |
| January-14 | Revised blueprints are submitted to the assessment advisory group to determine if a standard setting needs to be conducted for the new tests | Science Advisory Group and Assessment Advisory Group |
| February-14 | Revised new GPS for all other science courses is submitted to the Board for adoption as item for information | Georgia Department of Education curriculum staff. |
| February-14 | Develop item and content domain specifications for possible physics and chemistry EOCTs | Science Teachers |

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| Date | Activity | Participants |
|---|---|---|
| March-14 | Revised item and content domain specifications for the 3-8 science CRCT and the biology and physical science EOCT to align with the revised science GPS | Science Teachers |
| March-14 | Information meeting with school leadership teams (e.g. School Principal, Science Team Leader, Science Department Chair, etc.) | Science Program Manager |
| April-14 | Develop physics and chemistry test items for possible EOCTs field-testing | Science Teachers |
| April-14 | Develop test items for 3-8 science CRCT and the biology and physical science EOCT for field-testing | Science Teachers |
| August-14 | Science professional development at the district and school level begins | Science Program Manager |
| June-15 | The revised science GPS is implemented in the classroom | Science Teachers |

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Appendix B

| Name | Position |
|---|---|
| Amanda Buice | Math Science Partnerships (MSP)<br>Program Specialist – Georgia Department of Education |
| Dr. Gilda Lyon | Science, Technology, Engineering, and Mathematics (STEM)<br>Program Specialist –Georgia Department of Education |
| Phyllis Johnson | Career, Technical and Agricultural Education (Healthcare Science)<br>Program Specialists –Georgia Department of Education |
| Kayse Harshaw | Special Education<br>Intellectual Disabilities Specialist –Georgia Department of Education |
| Terry George | President<br>Georgia Science Supervisors Association |
| Sally Creel | President<br>Georgia Science Teachers Association |
| Amanda McGehee | Teacher<br>Dunwoody Elementary School |
| Rachael Parr | Teacher<br>East Jackson Middle School |
| Teddye Martin | Teacher<br>Fayette County |
| Marlee Tearce | Teacher<br>Science Presidential Award Winner |
| Betty Ellis | Curriculum Director<br>Berrien County School System |
| Donald White | Science Curriculum Specialists<br>Coweta County Schools |
| Sharon Boyer | Science Coordinator<br>Fayette County Schools |
| Dr. Christopher Robinson | Middle School Science Coordinator<br>DeKalb County Schools |
| Dr. Adrian Epps | Associate Dean, College of Science and Mathematics<br>Kennesaw State University |
| Dr. George Stickel | Professor<br>Southern Polytechnic State University |
| Dr. Phil Gibson | Bioscience Program Director<br>Gwinnett Technical College |
| Steve Rich | Coordinator, Georgia Youth Science & Technology Centers |
| Claire Swinford | Coordinator, NASA Regional Educator Resource Center<br>Warner Robins Aviation Museum |
| Stacy Graison | Director of Education<br>Zoo Atlanta |
| Jennifer Warner | Fernbank Museum of Natural History |

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| Science Education Advisory Group | |
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| **Name** | **Position** |
| Pamela Krohne-Googe | Teacher<br>C.A. Roberts Elementary School |
| Catherine Robinson | Teacher<br>Windsor Forest Elementary School |
| Amanda Prather | Teacher<br>Langston Chapel Elementary School |
| Vicki Jacobs | Teacher<br>Clayton County |
| Nancy Sills | Teacher<br>Carver Middle School |
| Donataneia Traylor | Teacher<br>Griffin-Spalding Middle |
| Rachael Parr | Teacher<br>East Jackson Middle School |
| Rochelle Lofstrand | Teacher<br>North Springs Charter High School |
| Dr. Cheryl Young | Teacher<br>Benjamin E. Mays High School |
| Trish DuBouse | Teacher<br>Camden County High School |
| Judy Holwell | Teacher<br>Colquitt County High Schools |
| Dr. Norm Thompson | Professor<br>College of Education<br>University of Georgia |
| Dr. Gail Marshal | Science Education Professor<br>University of West Georgia |
| Dr. Bob Powell | Physics Professor<br>University of West Georgia |
| Dr. Zodiac Webster | Physics Professor<br>Columbus State University |
| Dr. Greg Rushton | Chemistry Professor<br>Kennesaw State University |
| Dr. Karol Stephens | Director of Science<br>Fulton Public Schools |
| Dr. Joe Covert | Professor<br>North East Georgia |
| Dr. Leslie Sandra Jones | Professor of Biology<br>Valdosta State University |
| Dr. Pamela Gore | Professor of Geology<br>Georgia Perimeter College |
| Dr. Rosalie A. Richards | Professor<br>Science Education<br>Middle Georgia College |
| Dr. Tom Weiland | Professor of Physics<br>Georgia Southwestern State University |
| Dr. Roger Hill | Engineering Professor<br>University of Georgia |
| Dr. Bill Witherspoon | Professor<br>Fernbank Science Center |

# Next Generation Science Standards State Application

| Science Education Advisory Group | |
|---|---|
| **Name** | **Position** |
| Mary Elizabeth Davis | Director of Science, K-12<br>Gwinnett County Public Schools |
| Owen Ogletree | K-12 Science Content Specialist<br>Walton County Public Schools |
| Dr. Alfred Porter | Science Program Manager<br>Atlanta Public Schools |
| Tom Brown | 6-12 Science Supervisor<br>Cobb County Public Schools |
| Dr. Jone Bourassa | Science Coordinator<br>Bibb County Public Schools |
| Horace A. Bentley Jr. | Secondary Science Curriculum & Instructional Supervisor<br>Daugherty County Schools |
| Horace Magwood | Science Curriculum Director<br>Chatman County |
| Dr. Kimberly Emanuel | Science, Health & PE Coordinator<br>Henry County Public Schools |
| Dr. Sandy Martin | Research Biologists<br>MPIR Laboratory |
| Dr. Cindy Groff-Vindman | Kilpatrick-Stockton LLP |
| Dr. Pat Marsteller | Head of the Mercer Center for Science Education |
| Miriam Jordan | Science Program Specialist<br>Oconee RESA |

# Next Generation Science Standards State Application

Appendix C

STATE OF GEORGIA
OFFICE OF THE GOVERNOR
ATLANTA 30334-0900

Nathan Deal
GOVERNOR

July 15, 2011

Dr. Stephen Pruitt
Vice President for Content, Research and Development
Achieve
1400 16th Street NW, Suite 510
Washington, DC 20036

Dear Dr. Pruitt,

I write to express my full support for Georgia's application to become a lead state in the development of the Next Generation Science Standards.

Georgia has committed significant resources to reforming and improving education in our state. By focusing on outcomes, we have made considerable progress in improving overall student achievement. We recognize the key role that science plays on each citizen's ability to think critically about current issues and to succeed in a global economy.

Georgia has recently made aggressive and positive changes to its education policy, particularly in the area of STEM education. We have increased the number of science and mathematics units required for high school graduation, and we have committed through Race to the Top to using science as the AYP second indicator for all elementary and middle schools. We have also increased pay for newly certified math and science teachers and those who are in the first five years of teaching in an effort to help the state recruit and retain effective teachers in these critical areas. Additionally, because we understand that students must receive a strong foundation in STEM education in elementary school, we passed a law to provide an annual stipend to elementary school teachers who receive an endorsement by taking four math and science courses aimed at improving their content knowledge and instructional practices in these areas. These changes, coupled with high standards and a strong curriculum, will help assure that Georgia students receive a well rounded and robust science education.

Georgia's participation in the development and implementation of the Next Generation Science Standard is the logical next step, and we will be a strong partner in this work. I encourage your favorable consideration of our application and look forward to partnering with you.

Thank you for the work you do to help states make education relevant and rigorous for all students.

Sincerely,

Nathan Deal

Nathan Deal
Governor

**Georgia**
**State Board of Education**

July 15, 2011

Dr. Stephen Pruitt
Vice President for Content, Research and Development
Achieve
1400 16th Street NW, Suite 510
Washington, DC 20036

Dear Dr. Pruitt,

The members of the Georgia State Board of Education (SBOE) take great pleasure in expressing our support for Georgia's application to become a lead state in the development of the Next Generation Science Standards.

The SBOE is charged with providing the statewide leadership necessary to ensure opportunities are available for each public school student to be successful. We work to create an environment in which local schools and school systems are empowered to develop policies and programs that meet the educational needs of students. This empowerment supports teachers, parents and communities throughout the educational process.

Georgia has committed significant resources to reforming and improving education in our state by focusing on outcomes. The SBOE recognizes the key role that science plays on a citizen's ability to think critically on current issues and how to succeed in a global economy. Georgia recently instituted changes in the graduation requirements by increasing the number of necessary science and mathematics credits for graduation. Georgia's Race to the Top application sealed the commitment to grant science as the second Annual Yearly Performance indicator for all elementary and middle schools.

Georgia's participation in the development and implementation of the Next Generation Science Standard is the logical next step in assuring that Georgia's students are exposed to major advances in science, technology and engineering.

Sincerely,

Wanda L. Barrs

Wanda Barrs, Chair
State Board of Education

BOARD OF REGENTS OF
THE UNIVERSITY SYSTEM OF GEORGIA

CHANCELLOR HENRY "HANK" HUCKABY
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

PHONE: (404) 656-2202
FAX: (404) 657-6979
EMAIL: CHANCELLOR@USG.EDU

July 15, 2011

Dr. Stephen Pruitt
Vice President for Content, Research and Development
Achieve
1400 16th Street N.W., Suite 510
Washington, D.C. 20036

Dear Dr. Pruitt,

I write to express my full support for Georgia's application to become a lead state in the development of the Next Generation Science Standards.

Georgia has committed significant resources to reforming and improving education in our state and by focusing in outcomes, we have made considerable progress in improving the overall student achievement. We recognize the key role that science plays on each citizen's ability to think critically about current issues and to succeed in a global economy. Georgia's recent and positive changes in graduation requirements, augmenting the number of necessary science and mathematics credits for graduation to four and the commitment stated on Georgia's Race to the Top application to make science their second AYP indicator for all elementary and middle schools assured that Georgia students received a well rounded science education.

The University System of Georgia plays a vital role in preparing effective teachers for Georgia's schools, and the preparation of teachers is an important element of the Board of Regents' Strategic Plan. The collaboration between the University System of Georgia and the Georgia Department of Education extends to the areas of curriculum and instruction development through the participation of our institution's STEM faculty in development of instructional materials and advising in the writing of the Georgia Performance Standards for all 9-12 science and mathematics courses and K-8 subjects.

Georgia's participation in the development and implementation of the Next Generation Science Standard is the logical next step in assuring that Georgia's students are exposed to major advances in science, technology and engineering as well as the skills required for being scientific literate members of society.

Sincerely,

Henry M. Huckaby
Chancellor, The University System of Georgia

SOUTHERN POLYTECHNIC STATE UNIVERSITY

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Division of Academic Affairs

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June 29, 2011

Juan-Carlos Aguilar
Science Program Manager; Division of Curriculum, Instruction and Assessment
Georgia Department of Education
205 Jesse Hill Jr. Drive SE; 1754 Twin Towers East
Atlanta, GA 30334

Dear Dr. Aguilar,

I am very pleased to write this letter of support for the Department of Education as you begin revision of the Georgia Performance Standards science curriculum to keep pace with Georgia's needs, the coming national curriculum, and global implications. The GPS science curriculum has been a strong start in motivating and retaining students in science, to integrating technology in the curriculum, and to emphasizing reading and writing in context.

If we wish to continue moving students ahead in critical observation, recording, reflection, and communication, it is imperative that we periodically re-examine and revise the curriculum. Georgia's GPS science curriculum (along with a small handful of other states) has set a standard for student engagement, growth, and application. The coming national standards in science make it clear we will need to increase student immersion in the exploring, experimenting, discussing, and applying science. As students gain confidence in their scientific abilities, such efforts will improve the valuing of science within the schools and communities.

I am pleased to hear that you have selected our new director of teacher education, Dr. George Stickel, to serve on your review and revision committee for the GPS science curriculum. Southern Polytechnic is committed to working to strengthen the relationship of the University with the schools and the community. Our new teacher education program will help consolidate some of those efforts. Dr. Stickel is an excellent choice since he has worked closely with the DOE in the past, helping to write the high school science GPS, serving on your advisory council, and serving in other state science leadership roles. Participating in the revision process will strengthen our preparation of science teachers and our service to the state.

We at Southern Polytechnic are supportive of your efforts to begin a systematic examination and revision of the GPS science curriculum, and to improve science and STEM education in Georgia. We look forward to working with the DOE to promote our mutual efforts in support of science education.

Sincerely,

Zb Szafran
Vice President, Academic Affairs

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