

National Association of State Boards of Education

⊕ Common Themes, Individual Approaches Six States' Experiences with New Science Standards

By Francis Eberle

The selection of new science standards—or any standards—is a significant undertaking. In the process of reviewing, revising, adapting, and adopting them, all states must engage advisory groups and constituents, find resources to facilitate the process, and communicate about why the effort is important. Beyond these common elements, there are many paths to adoption and implementation. Many states are considering whether to modify existing science standards, adopt the Next Generation Science Standards (NGSS)—as 13 states and the District of Columbia have done, or develop new ones. In response, the National Association of State Boards of Education (NASBE) developed a program to help state boards of education navigate this complex process.

In spring 2014, NASBE awarded six state boards of education \$4,000 stipends to aid their science standards work. The state boards included Arkansas, Delaware, District of Columbia, Kentucky, New Jersey, and West Virginia. Each state board proposed concrete goals and activities to address their needs. The six state boards either were considering adoption of new science standards or had recently adopted them and were working on policies related to their implementation.

The stipends are intended to increase a state board's capacity, time, and/or capability to

adopt and implement the standards. State boards used the funds for hosting retreats, communicating with stakeholders about the process, convening special task forces of cross-state stakeholders, attending relevant conferences, or hosting regional meetings for local school boards and other interested constituents (figure 1). This *State Innovations* report is an overview of the state-by-state efforts and their impact. Owing to the complexity of standards adoption, all of the states and the District of Columbia are continuing this work in 2015.

ARKANSAS

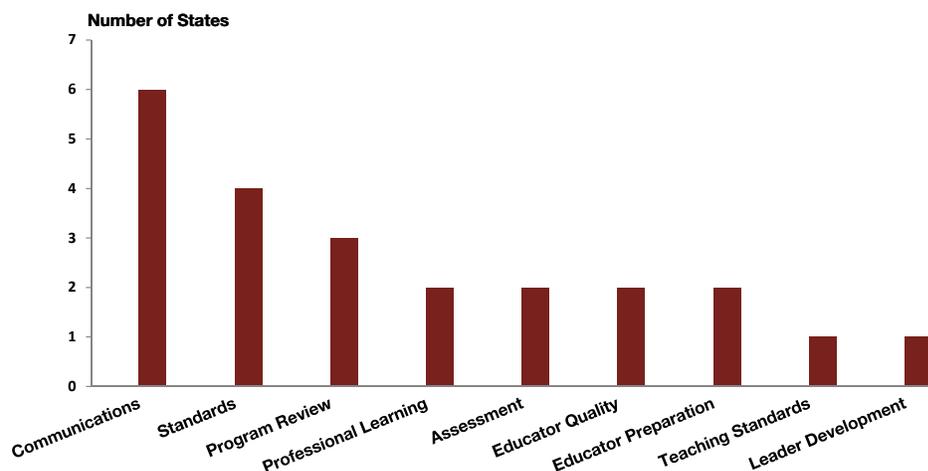
In 2011, Arkansas became one of 26 lead states for the development of the NGSS. Each lead state agreed to participate in NGSS development by establishing a state

review committee to produce feedback for the writing teams and by providing communication about the development of the science standards. They were not required to adopt the standards once completed. Also, the state board and state chief had to agree to this involvement.

After the NGSS was released in 2013, the Arkansas state board unanimously endorsed it as the set of standards from which new K-12 science standards in Arkansas would be developed. This endorsement, unlike the typical state board standards adoption process, only authorizes the Arkansas Department of Education to begin a review process on science standards for Arkansas.

Since the state board's endorsement, Arkansas's Department of Education has been preparing districts to implement the new standards. The department has developed a timeline and a statewide plan, with implementation beginning with grades K-4 in 2016-17, grades 5-8 in 2017-18, and grades 9-12 in 2018-19. (See <http://www.arkansased.org/divisions/learning-services/curriculum-and-instruction/arkansas-k-12-science-standards>.)

Fig. 1 Stipend States' Activities



The state board used its stipend to involve the community in learning about the new science standards. They sought to 1) help educate the general public and policy leaders outside the state education agency, 2) inform state board members about the standards, and 3) aid key state board staff as they prepare to work with Arkansas teachers in the coming years.

Supporting activities included discussion during state board meetings; a public address at the University of Arkansas by James Gates, Maryland state board member and physics professor at the University of Maryland, on the importance of the standards; testimony before a joint meeting of the Arkansas House and Senate Education committees; and a state board retreat at which NASBE staff answered questions,

provided background on the national landscape, and helped the board move through the formal adoption process.

At this writing, the Arkansas board is still working with various constituencies on standards adoption. The endorsement rule was enacted pursuant to the board's authority under Ark. Code Ann. §§ 6-11-105, 6-17-402 and 25-15-201 et seq. (<http://www.sos.arkansas.gov/rulesRegs/Arkansas%20Register/2010/Jan10Reg/005.16.09-004.pdf>).

DELAWARE

Ahead of Delaware's adoption of the NGSS in fall 2013, it engaged in a number of preparatory steps. The department of education and the state board held four town hall meetings throughout the state to explain what the standards were, why they were needed, and

how adoption would align with the larger Delaware education plan. The state board also held multiple work and retreat sessions for its members to gain deeper understanding of the standards as well as with additional constituencies around the state. The SBE subsequently put NGSS implementation issues on its agenda every three months.

Delaware has a strong state science coalition comprising science educators, businesses, and institutions of higher education (IHEs). The coalition developed statewide curricular units that are lab based and include kits for Delaware schools. The coalition also provides Delaware educators help with curricular alignment, professional development, and development of follow-on units.

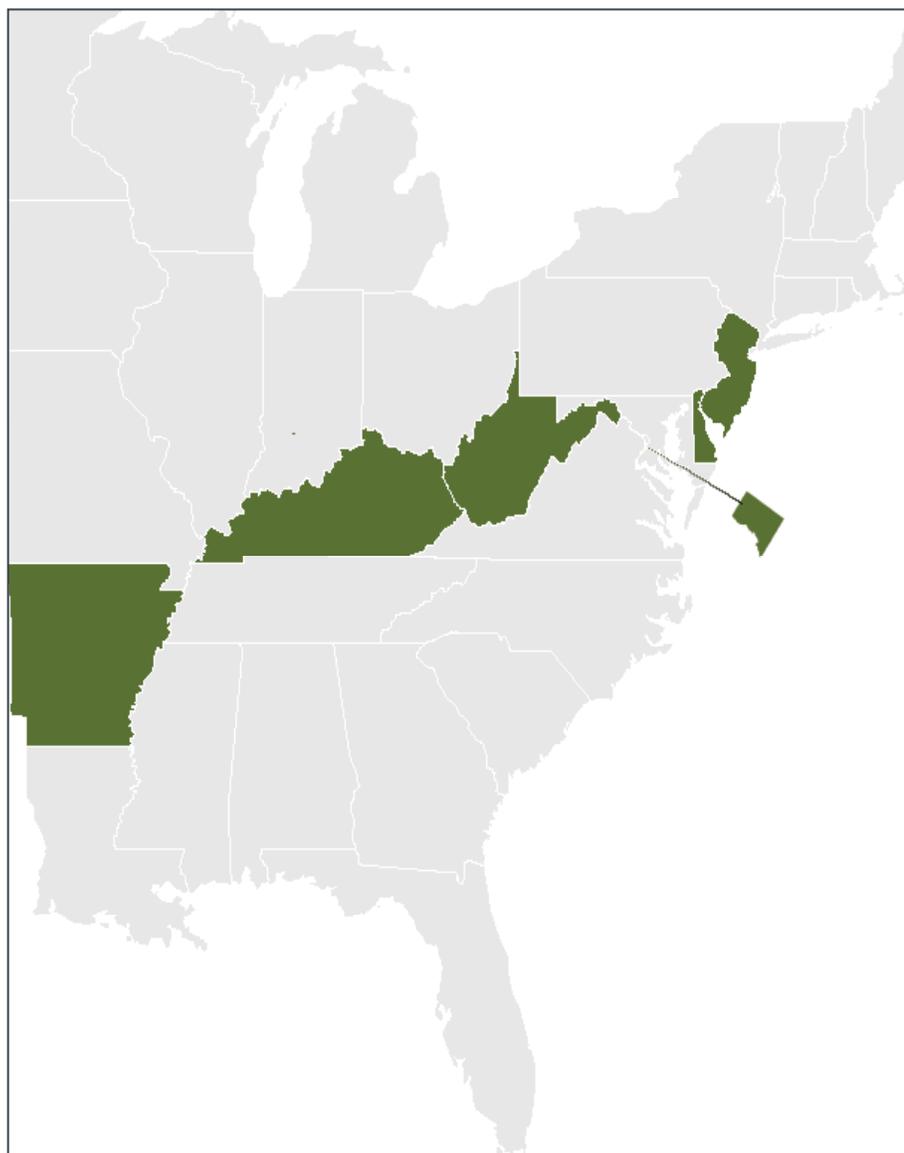
The NASBE stipend allowed Delaware to leverage two streams of SBE work: the adoption of the science standards and revision of its educator evaluation system and implementation of an administrator evaluation tool. Through a connected stipend, Delaware was able to extend its work on science standards implementation to other policies related to the NGSS.

The goals of the state board's stipend work were to 1) communicate its implementation plan and develop a deeper understanding of the NGSS throughout the community, 2) build awareness of policy leaders on implementation of NGSS and how it affects other statewide education initiatives such as career and technical education and statewide assessments, and 3) develop stronger partnerships with businesses, IHEs, and community programming partners engaged in science and STEM education.

To accomplish these goals, the board hosted multiple workshops with local school board members, union representatives, community representatives, IHEs, legislators, and parents; provided an overview of the new educator evaluation systems aligned to college- and career-ready standards and assessment activities from multiple states and using rubrics, including those of Charlotte Danielson, TNTP, and the Teaching Excellence Framework; regularly discussed the implementation of NGSS and local policy levers; provided three webinars on educator evaluation research and state practices; and built NGSS web guidance and resources.

These activities supported the review and in

Fig. 2 Six Science Stipend States



some cases revision of the following policies:

- Regulation 501 - addressed adoption of NGSS (<http://regulations.delaware.gov/AdminCode/title14/500/501.shtml>)
- Regulation 101 - assessment system (<http://regulations.delaware.gov/AdminCode/title14/100/101.shtml>)
- Regulation 103 - accountability system (<http://regulations.delaware.gov/AdminCode/title14/100/103.shtml>)
- Regulation 106A, 107A, 108A - educator evaluation system (<http://regulations.delaware.gov/AdminCode/title14/100/106A.shtml>)
- Regulation 1595 - certification programs for leaders in education (<http://regulations.delaware.gov/AdminCode/title14/1500/1595.shtml>)
- SB 168 - allows for alternate educator evaluation system (<http://legis.delaware.gov/lis/lis147.nsf/vwlegislation/249634AFCA78A05C-85257C6E0074F9D1>)

DISTRICT OF COLUMBIA

The DC state board adopted NGSS in December 2013. The state board's vision was that NGSS coupled with the Common Core State Standards could transform STEM education and prepare all DC students to succeed in education, work, and daily lives. The Office of the State Superintendent of Education hired a new state science coordinator earlier in 2013 who worked closely with science teachers and the state board to ensure deep understanding of the NGSS and their merits. The state board also worked with the National Academy of Sciences, NASBE, and Achieve Inc. to ensure that state board members were fully informed about the science standards.

The goals of the DC board's connected stipend were to 1) strengthen public buy-in through community engagement and 2) build capacity to support the state board's monitoring and reporting of NGSS implementation and assessments. To accomplish these goals, the board held regular public hearings on NGSS, published an annual report on implementation, attended a state leadership team meeting, voted on a resolution including recommendations for improving implementation, established a protocol for reviewing academic standards implementation, and developed and implemented a survey to

better understand schools' needs.

The DC state board has little policymaking authority. However, members used their influence by convening groups and asking questions. They were able to do the following:

- adopt a resolution with recommendations for improving the NGSS implementation;
- develop a protocol for reviewing academic standards implementation;
- sponsor NGSS community meetings and host a citywide STEM summit;
- survey school leaders and teachers about NGSS implementation; and
- strengthen communication and collaboration through convening of stakeholders.

KENTUCKY

On September 20, 2011, Kentucky became one of the 26 lead states for the development of the NGSS. The Kentucky state board approved the NGSS as the Kentucky Core Academic Standards for Science in June 2013. The science standards completed a legislative review and are now being implemented as part of the Kentucky Core Academic Standards.

The goals of Kentucky's connected stipend were to 1) provide professional development for Kentucky's educational leadership, state superintendents, and administrators through work sessions, 2) develop a communications strategy for the overall initiative as it is implemented, and 3) communicate its strategy in a presentation at the annual superintendent summit.

The state board held a work session about innovative assessment structures, created resource materials for state board members to use in communications about the benefits of the new structures, and prepared its members for a communication session at a statewide superintendent summit. These activities will support the development of Kentucky's federal waiver to allow for new and innovative science assessment methods and to develop the leadership capacity in the state board to be champions for innovative assessment structures. Additionally, the state board developed a communications plan on the importance and validity of the

alternative assessment structures. Science has been a catalyst for addressing broader concerns around appropriate assessments in Kentucky.

The following are the policy impacts from Kentucky's activities:

- A plan for the design of a new science assessment and its format is an ongoing topic of conversation in 2015. The initial stipend work was just the beginning of Kentucky's efforts to help SBE members understand deeper learning in science and trends in assessment. It gave them an initial knowledge base upon which later policies will be based. The board considered changes to the state's accountability system (<http://education.ky.gov/KBE/meet/Documents/Summary%20Minutes%20June%202013.pdf>).
- 704 KAR 3:303, Kentucky Core Academic Standards. The board reviewed changes initially at an October 7, 2014, board meeting, had the official first reading of the regulations on December 4, and finalized them on February 4, 2015. Knowledge gained from an earlier retreat session on science assessment prepared the board to make these decisions.

NEW JERSEY

The New Jersey State Board of Education was also one of 26 lead states in development of the NGSS. The Christie administration had emphasized the general importance of standards and a goal of improving preparation for STEM careers in particular in advance of the board's July 2014 adoption of content standards in seven K-12 subject areas including science.

The state board sought to use its stipend to educate multiple constituencies about 1) the importance of STEM fields to New Jersey and 2) how the NGSS fosters economic growth in New Jersey by giving its students a solid foundation in math and science. To this end, the state board and the state's department of education hosted three regional meetings to receive public comment on the NGSS and two informational webinars for stakeholders, sent informational emails to a science Listserv and professional organizations, and hosted a statewide summit. The presentation was videotaped and posted on the department's website. Also as a part of their communications work, the board developed short videos for state and local

board members. The videos will support the use of the department of education's model science curriculum and more tightly connect practitioners to statewide policies and their new vision for K-12 science.

The state summit included state board members, business and industry stakeholders, LEE Group, and Chamber of Commerce officials, and it was hosted at the Liberty Science Center, with Achieve's Stephen Pruitt presenting. In addition, a strategic implementation plan meeting was held with the state board and superintendents, supervisors, teacher preparation institutions, Liberty Science Center personnel, and Newark museum personnel.

This work covered evaluation and revision of the following policies:

- The state board of education adopted the NGSS into New Jersey's State Education Standards, P. L. 1990, c. 52, P. L. 1991, c. 3 and P. L. 1991, c. 62, with the authority to establish the state's educational goals and standards (<http://www.state.nj.us/cgi-bin/education/sboe/sboe.pl?y=2014&m=July&t=public>).
- The state board helped make the NGSS a central organizing principle for a statewide STEM commission that the governor has charged with improving the pipeline of qualified candidates for STEM employment. Higher education, business and industry, and philanthropic organizations are working together on this statewide project.

WEST VIRGINIA

Also one of the 26 lead states, West Virginia engaged in a number of activities in preparation for its eventual adoption of NGSS in April 2015. Some state board members attended a NASBE regional symposium in 2013 and then briefed the full board. In November 2013, the state board was briefed on a proposed five-year plan for adoption and implementation. A broad-based stakeholder group was selected and convened in February 2014 to review the NGSS and the initial plan. Members came from public education, higher education, professional organizations, business and industry, scientific enterprises, civic

organizations, legislative bodies, business alliances, and governmental agencies.

The West Virginia board sought to use its connected state stipend to 1) communicate the five-year plan for the NGSS to local boards of education and district leadership, and 2) align current policy in advance of the deployment of the NGSS with Governor Earl Ray Tomblin's statewide STEM initiative. To accomplish these goals, the state board reviewed the NGSS, compared them with current standards, provided an overview of the NGSS and the subsequent plan for deployment with local school board members, provided briefings to the House and Senate Education leadership on policy development and deployment, shared information regarding the importance and content of NGSS, convened the NGSS stakeholder group as needed for guidance, collaborated with the office of the governor, collaborated with the Higher Education Policy Commission to align expectations of preK-12 with IHEs, and collaborated with the WB Education Alliance on their statewide STEM project. The state board collaborated and coordinated with other entities and organizations to elevate the importance of science education. After a year and half, the state board was able to navigate a difficult adoption process and adopted new science standards this April. The work for West Virginia's connected stipend led to evaluation and revision of the following policies:

- 5100: Approval of Educator Preparation Programs §126CSR114
- 5050: West Virginia Commission for Professional Teaching Standards §126CSR154
- 2510: Assuring the Quality of Education: Regulations for Educational Programs
- 5899: Beginning Principal Internships §126CSR164
- 5800: Standards of Professional Practice for West Virginia Superintendents, Principals, and Teacher Leaders §126CSR165
- 5310: Performance Evaluation of School Personnel §126CSR142

CONCLUSION

The state examples reveal the potential length and complexity of science standard adoption and implementation. These six states took different routes to achieve NGSS adoption and examined a variety of related policies as part of implementation.

However, the six states shared several common strategies and activities. All had a communication strategy to reach and engage educators and constituents that included face-to-face meetings, larger "summit" meetings, and messaging through print, web-based communications, and videos. They all sought to connect state policymaking with state stakeholders who the policy changes would affect. Each state board recognized that science standards are related to other policies, such as those for teacher and leader preparation, evaluation, and assessment. Their broader view underscores the important role that a state board's understanding of its state's education system can play. Finally, the state boards realized that the K-12 system is linked to the state's overall vision for citizenship and economic productivity. They found ways to associate science standards with an articulated vision of the state's future.

Many activities can further the process of adopting and implementing science standards. More important than the selection of activities itself is the thoughtful planning around the timing of those activities and the selection of participants, carefully aligned with the state's policy context and stakeholder interests.

RESOURCE

New Science Standards: A Readiness Assessment for State Boards of Education. This resource is a tool to help state boards consider the various aspects of adopting and implementing science standards: (http://www.nasbe.org/wp-content/uploads/Science-Standards-Readiness-Assessment-for-State-Boards-of-Education_April-2015.pdf)

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