

# ARKANSAS

## K-12 SCIENCE STANDARDS

EDUCATION FOR A NEW GENERATION

A COMPREHENSIVE PLAN FOR THE DEVELOPMENT  
AND IMPLEMENTATION OF  
ARKANSAS'S K - 12 SCIENCE STANDARDS

*NOTE: This plan is intended to be a working document. As the Curriculum and Instruction Unit leads the development process, modifications could be needed. The most current plan will always be found on the Science Standards page on the ADE website.*

*Created May, 2014  
Updated December, 2014*

# CURRICULUM AND INSTRUCTION

Successful implementation of Arkansas's K-12 Science Standards requires the development of rigorous standards that identify what students should know, understand, and be able to do in science, and the local creation of a well-developed curriculum that supports student learning.

<u>Start Date</u>	<u>Task Title</u>	<u>Description</u>	<u>Completion Date</u>
October 2010	ADE Reviews Draft Version of Framework for K-12 Science Education	Catherine Mackey, ADE Science Specialist for Assessment and Curriculum, provided input to the National Research Council's Board on Science Education on the draft version of the Framework.	October 2010
October 2011	Agreement to Become a Lead State in the Development of NGSS	Dr. Tom Kimbrell, Arkansas Commissioner of Education, and Dr. Ben Mays, State Board of Education (SBE) Chair, signed the Lead State Agreement, committing Arkansas to act as one of the 26 lead states in the development of the Next Generation Science Standards (NGSS).	October 2011
November 2011	NGSS State Lead Named	Michele Snyder, ADE Science Specialist for Curriculum and Instruction, was named state lead during the NGSS development process.	November 2011
January 2012	NGSS Broad-Based Stakeholder Committee Meeting	The 39-member committee, composed of educators for Grades K-12, STEM business and industry leaders, career and technical educators, informal science educators, higher education representatives, and an Arkansas SBE member, met five times to review drafts of the NGSS. Feedback from these meetings was provided to the state-led team writing NGSS.	January 2013
January 2012	Collaboration with Multi-State Action Committees	Michele Snyder and Catherine Mackey, through the Council of State Science Supervisors (CS3) and Council of Chief State School Officers (CCSSO), collaborated with other lead state representatives in order to review drafts, provide input on assessment boundaries and clarification statements, and discussed the format of NGSS.	February 2013
April 2012	Licensure Alignment	Michele Snyder and Janie Hickman, ADE Curriculum and Instruction Unit specialists, met with representatives from the ADE Licensure Unit to make recommendations for the science competencies required for teachers seeking Grades K-6 licensure.	December 2012

May 2012	NGSS Public Comment Period by Arkansas Stakeholders	Arkansas educators were provided information to access the public releases of the draft standards and provide feedback.	January 2013
April 2013	Final Version of NGSS: For States, By States Released to Public	<a href="http://www.nextgenscience.org">www.nextgenscience.org</a>	April 2013
May 2013	Licensure Alignment	Michele Snyder and Janie Hickman met with staff from the ADE Licensure Unit and representatives from higher education to make recommendations for the science competencies required for teachers seeking Grades 4-8 licensure.	October 2013
June 2013	Arkansas NGSS Review Committee	This 44-member committee, composed of K-12 educators, career and technical educators, and higher education representatives met for four days to review each standard in NGSS. A consensus of key questions focused on criteria of the standards, including engineering design and concepts, connections to the Common Core State Standards, instructional implications, and learning progressions.	June 2013
September 2013	Licensure Alignment	Michele Snyder met with staff from the ADE Licensure Unit and representatives from higher education to review science competencies required for teachers seeking licensure in secondary science.	January 2014

<p>April 2014</p>	<p>ADE State Board Endorsement</p>	<p>The following announcement was shared with Arkansas educators via the CCSS ListServ:          "We are excited to inform you of a unanimous vote by the Arkansas State Board of Education to endorse the use of the Next Generation Science Standards (NGSS) as a basis for the next stage of our work in the development of a new K - 12 Arkansas Science Curriculum Framework. The endorsement authorizes the Curriculum and Instruction Unit at the Arkansas Department of Education (ADE) to use the NGSS as a guide for our work as we build upon the great body of research and expertise that engaged in the development of NGSS and provides an opportunity for us to continue to work with our educators to make these standards our own. Committees of Arkansas educators will dive deeper into the NGSS performance expectations for K - 12 students, develop middle school pathways, and examine existing Arkansas standards and laws, as well as licensure needs, to create high school courses. Our goal is to prepare our students to know and apply science concepts to real-world situations when they graduate from high school. This work will take time. The first task for the ADE will be to develop a comprehensive roll-out plan, a detailed timeline, and a communication plan for new science curriculum frameworks. The Curriculum and Instruction Unit will work with representatives from K - 12, career education, higher education, industry, community and informal science educators to complete this work. Opportunities will be provided for public input and comment.          As this work progresses, please remember that the current Arkansas Science Curriculum Frameworks and Science Benchmark and EOC Biology assessments will be in place for the 2014 - 2015 school year and beyond. Updates to this timeline will be included in our communications to schools.          Helpful links:          NGSS – <a href="http://www.nextgenscience.org">www.nextgenscience.org</a>          ADE – Curriculum Frameworks for science – <a href="http://www.arkansased.org/divisions/learning-services/curriculum-and-instruction/frameworks/curriculum_categories/science">http://www.arkansased.org/divisions/learning-services/curriculum-and-instruction/frameworks/curriculum_categories/science</a> "</p>	<p>April 2014</p>
<p>April 2014</p>	<p>Licensure Alignment</p>	<p>Dr. Tracy Tucker, Director of Curriculum and Instruction at ADE, and Catherine Mackey met with staff from the Licensure Unit at ADE and representatives from higher education to offer advice on options for changes in Praxis Assessment requirements for licensure in secondary physical science.</p>	<p>April 2014</p>

May 2014	Expert Review	<p>ADE contracts with two nationally-known science education experts to review the 2005 Arkansas Science Curriculum Frameworks and make recommendations for revisions to Arkansas K-12 Science Curriculum Frameworks. Dr. William Penuel (Professor of Educational Psychology and Learning Sciences, School of Education, University of Colorado at Boulder) was contracted to review the K-8 Science, Physical Science, Biology, Chemistry, and Physics Curriculum Frameworks.</p> <p>Dr. Philip Bell (Professor of the Learning Sciences, The Shauna C. Larson Chair in Learning Sciences, University of Washington) was also contracted to complete a second review of the same curriculum frameworks.</p>	December 2014
July 2014	Science EQUiP Rubric and Quality Review Meeting	<p>ADE brings a team of Arkansas educators to Washington DC to engage with other state teams in the review of the EQUiP Rubric and its use in evaluating the quality and alignment of a common lesson to identify specific ways to strengthen a lesson. The team was composed of Coop Science Specialists, Classroom science teachers, district science coordinators, and ADE science advisor, Michele Snyder.</p>	July 2014
September 2014	Stakeholder Input	<p>ADE will administer surveys to educators of Grades K-12, post-secondary, workforce (Arkansas Department of Career Education [ACE]), and K-12 community members. These community members will include stakeholders from the business and technology industry, and other interested parties.</p>	September 2014
October 2014	K-8 Committee Work	<p>ADE will form a committee of Arkansas teachers and instructional personnel from public schools, assisted by teachers from institutions of higher education. The committee will convene to review the external reports by outside content experts, review the survey results, and study reports from national groups and organizations. The scope of work for this committee will be to "...establish clear, specific, and challenging academic content standards which define what students shall know and be able to do in each content area." (ACA 6-15-404)</p>	February 2015

April 2015	SBE Action Agenda Item	ADE Curriculum and Instruction Unit will prepare an action agenda item that petitions the SBE for adoption of <i>Arkansas K-12 Science Standards</i> for Grades K-8.	April 2015
Spring 2015	Support Evaluation of Science Instructional Materials	ADE will provide tools and support to assist educators in the evaluation of Grades K-4 science instructional materials.	Ongoing
Summer 2015	9-12 Committee Work	ADE will form a committee of Arkansas teachers and instructional personnel from public schools, assisted by teachers from institutions of higher education. The committee will convene to review the external reports by outside content experts, review the survey results, and study reports from national groups and organizations. The scope of work for this committee will be to "...establish clear, specific, and challenging academic content standards which define what students shall know and be able to do in each content area." (ACA 6-15-404) This committee will write the three science courses required for graduation and make recommendations for ADE to consider changes for the Standards for Accreditation and graduation pathways.	October 2015
Summer 2015	Standards for Accreditation and Smart Core/Core Graduation Pathway	ADE Curriculum and Instruction Unit will compile guidance from the Grades 9-12 committee and share outcomes with the Commissioner of Education. These changes could include Rules Governing Standards for Accreditation of Arkansas Public Schools and School Districts (July 2009), requirements for high school graduation (Smart Core/Core), required 38 course offerings for high schools, the K-12 curriculum area descriptors. The guidance will be needed before the committee reconvenes in 2016.	January 2016
April 2016	SBE Action Agenda Item	ADE Curriculum and Instruction Unit will prepare an action agenda item that petitions the SBE for adoption of <i>Arkansas K-12 Science Standards</i> for Grades 9-12.	April 2016
Spring 2016	Licensure Alignment	ADE Curriculum and Instruction Unit science specialists will meet with the ADE Licensure Unit to discuss teacher preparation programs and possible changes needed to the current licensure requirements and higher education programs of study.	Spring 2016

August 2016	K-4 Standards Implementation	The <i>Arkansas K-12 Science Standards</i> for Grades K-4 will be implemented.	Ongoing
Fall 2016	Alternate Secondary Course Pathways Committee	ADE will form a committee of public school educators, assisted by teachers from institutions of higher education, to develop alternate secondary course pathways (e.g., career and technical, advanced, STEM).	Winter 2017
Spring 2017	SBE Action Agenda Item	ADE Curriculum and Instruction Unit will prepare an action agenda item for the SBE to consider approval of alternate secondary course pathways.	Spring 2017
August 2017	5-8 Standards Implementation	The <i>Arkansas K-12 Science Standards</i> for Grades 5-8 will be implemented.	Ongoing
Spring 2018	Support Evaluation of Science Instructional Materials	ADE will provide tools and support to assist educators in the evaluation of secondary science instructional materials.	Ongoing
August 2018	9-12 Standards Implementation	The <i>Arkansas K-12 Science Standards</i> for Grades 9-12 will be implemented.	Ongoing

# ASSESSMENT

**Successful implementation of the *Arkansas K-12 Science Standards* requires assessments that include the processes used to measure student progress toward attainment of the standards and the ongoing learning in the classroom.**

<u>Start Date</u>	<u>Task Title</u>	<u>Description</u>	<u>Completion Date</u>
2013	National Research Council (NRC) Report Released	The National Research Council (NRC) Board on Testing and Assessment released the report <i>Developing Assessments for the Next Generation Science Standards</i> .	2013
2013	Conclusion 1 from the NRC Report	Measure the three-dimensional science learning included in the framework and the NGSS assessment tasks to examine student performance of scientific and engineering practices in the context of disciplinary core ideas and crosscutting concepts.	2013
2013	Conclusion 2 from the NRC Report	The NGSS requires assessment tasks be designed to accurately locate students along a sequence of progressively more complex understandings of core ideas and more sophisticated applications of practices and crosscutting concepts.	2013
2013	Conclusion 3 from the NRC Report	The NGSS place significant demands on science learning at all grade levels. It is not feasible to assess all the performance expectations for a given grade level with any one assessment. Students will need multiple and varied assessment opportunities to demonstrate their competency on the performance expectations for a grade level.	2013
2013	Conclusion 4 from the NRC Report	Effective evaluation of three-dimensional science learning requires more than a one-to-one mapping between the NGSS performance expectations and assessment tasks. More than one assessment task may be needed to adequately assess mastery of some performance expectations, and any given assessment task may assess aspects of more than one performance expectation. In addition, to assess both understanding of core knowledge and facility with a practice, assessments may need to probe student use of a given practice in more than one disciplinary context. Assessment tasks that attempt to test practices in strict isolation from one another may not be meaningful as assessments of the three-dimensional science learning called for by the NGSS.	2013

2013	Science Assessment Symposium	ADE Student Assessment Unit staff members Catherine Mackey, Susan Gray, Suzanne Knowles, and Kevin Beaumont attended the Science Assessment Symposium to identify best practices for science assessment as outlined by the NRC report.	2013
2013	CCSSO Science State Collaborative on Assessment and Student Standards (SCASS)	Catherine Mackey and Michele Snyder collaborate with other state education agencies (SEA) science supervisors to identify examples of performance-based science assessment tasks that could be used formatively.	2014
2014	Current Arkansas Assessments Continue	The 2014 Science NCLB Assessments were administered to students in Grades 5, 7, and Biology.	April 2014
2014	Current Science Assessment Contract Extension	Discussions regarding the possible extension of the current science assessment contract are ongoing.	Ongoing
2014	Evaluate Current Science Assessment	The ADE Student Assessment Unit will collect and review best practices for transitioning science assessments aligned with <i>Arkansas K-12 Science Standards</i> .	2015
2014	CCSSO Science State Collaborative on Assessment and Student Standards (SCASS)	Ann Finch and Michele Snyder collaborate with science supervisors from other state education agencies (SEA) to identify examples of performance-based science assessment tasks that could be used formatively.	2015
2015	Investigate Potential Next Generation Science Assessments	The ADE Student Assessment Unit in collaboration with the Curriculum and Instruction Unit will investigate potential avenues for development of science assessment tasks. K-12 educational committees will be formed to advise in the process.	2016
2015	Current Arkansas Assessments Continue	The 2015 Arkansas Science Benchmark Assessments will be administered to students in Grades 5, 7, and Biology.	2015
2016	Current Arkansas Assessments Continue	The 2016 Arkansas Science Benchmark Assessments administered to students in Grades 5, 7, and Biology.	2016

2016	Select Option for Development of Next Generation Science Assessments	The ADE Student Assessment Unit will propose to the SBE a revision of the assessments for the <i>Arkansas K-12 Science Standards</i> .	2016
2016	Development of Arkansas Science Assessments Continue	Arkansas K-12 educators will be involved in the review, editing, and acceptance of items and/or tasks for the assessments of the <i>Arkansas K-12 Science Standards</i> .	Ongoing
2017	Engage Arkansas Educators in the Review of Assessment Items/Tasks	Begin administration and continue development of assessment items aligned to the <i>Arkansas K-12 Science Standards</i> .	Ongoing
2018	Engage Arkansas Educators in the Review of Assessment Items/Tasks	Continued administration and development of assessment items aligned to the <i>Arkansas K-12 Science Standards</i> .	Ongoing
2019	Implement New Science Assessments	Operational assessments aligned to the <i>Arkansas K-12 Science Standards</i> will be administered at elementary, middle, and high school levels.	Ongoing

## PROFESSIONAL DEVELOPMENT

**Successful implementation of the Arkansas K-12 Science Standards requires professional development that takes a "comprehensive, sustained, and intensive approach to improving teachers' and principals' effectiveness" in guiding student learning (National Staff Development Council, 2010).**

<u>Start Date</u>	<u>Task Title</u>	<u>Description</u>	<u>Completion Date</u>
2011	Picture Book Science Training	This two-day Grades K-6 training combines science and reading to equip teachers with strategies to integrate science and reading in the elementary/middle school classroom. These strategies included but were not limited to inquiry-based lesson development, content literacy strategies, science vocabulary, 5-E Instructional Model, high-yield assessment strategies.	Ongoing
April 2012	NSTA Conference	ADE, educational cooperative, and STEM Center science specialists attended and/or presented sessions on the three dimensions of the <i>Framework for K-12 Science Education</i> at the National Science Teachers Association(NSTA) Conference. Findings and results from Arkansas work were shared.	April 2012
Spring 2012	<i>Framework for K-12 Science Education</i> , Train-the-Trainer Model Training	A one-day introductory workshop was developed by ADE and presented to all educational cooperative and STEM Center science specialists.	Ongoing
May 2012	NGSS First Public Draft	Michele Snyder and all educational cooperative and STEM Center science specialists reviewed the first public draft of NGSS.	June 2012
May 2012	Planning for New Science Standards Workshop I: Introduction to Framework for K-12 Science Education	A statewide professional development presented by educational cooperative and STEM Center science specialists was offered to all Grades K- 12 science teachers through the educational cooperatives and STEM Centers.	Ongoing

Summer 2012	ACE Summer Conference, Arkansas Association of Alternative Educators (AAAE) Summer Conference, and Retreat for Division of Youth Services (DYS) teaching staff	Michele Snyder presented sessions on the <i>Framework for K-12 Science Education</i> .	Summer 2012
July 2012	Swifton School District	Michele Snyder presented a session on the <i>Framework for K-12 Science Education</i> .	July 2012
August 2012	Little Rock School District	Michele Snyder and Catherine Mackey presented a session on the <i>Framework for K-12 Science Education</i> .	August 2012
September 2012	Training for Science Specialists	Jane Dearworth, ADE Professional Development Unit Literacy Program Manager, and Michele Snyder presented in-depth training sessions to the educational cooperative and STEM Center science specialists at regularly-scheduled meetings to examine conceptual shifts in science education, based upon the <i>Framework for K-12 Science Education</i> .	Ongoing
November 2012	Arkansas Curriculum Conference (ACC)	Michele Snyder and Catherine Mackey presented a session on the <i>Framework for K-12 Science Education</i> .	November 2012
November 2012	Arkansas Association of Curriculum & Instruction Administrators (AACIA) Fall Conference	Michele Snyder and Catherine Mackey presented a session on the <i>Framework for K-12 Science Education</i> .	November 2012
January 2013	NGSS Second Public Draft Workshops at Educational Cooperatives and STEM Centers	Educational cooperative and STEM Center science specialists organized after-school workshops for teachers, administrators, higher education faculty, and parents to facilitate an opportunity for feedback on the final public draft of NGSS.	January 2013

February 2013	NGSS Final Draft Released; Training-of-Trainers Conducted	Jane Dearworth and Michele Snyder presented training to the STEM Center and educational cooperative science specialists on the final version of the NGSS. Focus areas included the disciplinary core ideas, crosscutting concepts and practices, as well as research and information to support implementation.	May 2013
April 2013	Next Generation Science Exemplar (NGSX) Pilot Meeting	Dr. Patricia Conner, ADE Data Literacy Specialist, and Michele Snyder attended state pilot training with the NGSX creators, Dr. Sarah Michaels from Clark University, Dr. Jean Moon from the Tidemark Institute, and Dr. Brian Reiser from Northwestern University, along with representatives from other interested states.	April 2013
May 2013	NGSX	Arkansas was accepted as one of twelve states to pilot a blended (web-based and face-to-face) professional development opportunity to engage teachers in the major ideas of the NRC's <i>Framework for K-12 Science Education</i> and the student performance expectations found in the NGSS.	May 2013
Summer 2013	Statewide Professional Development	Statewide professional development presented by educational cooperative and STEM Center science specialists was offered to all Grades K-12 science teachers through the educational cooperatives and STEM Centers.	Ongoing
September 2013	NGSX Training-of-Trainers Professional Development	Science specialists from the twelve university STEM Centers and ADE participated in the NGSX pilot. Training of one module was completed during the Professional Development Unit meetings held at Arch Ford Educational Cooperative and prepared specialists to facilitate NGSX professional development.	December 2013
October 2013	21st Century Community Learning Centers (CCLC) Conference	Catherine Mackey and Michele Snyder presented <i>Planning for New Science Standards</i> to conference attendees responsible for implementing after-school programs.	October 2013
November 2013	AACIA Fall Conference and Arkansas Curriculum Conference (ACC)	Catherine Mackey and Michele Snyder presented <i>Planning for New Science Standards</i> to conference attendees responsible for implementing after-school programs.	November 2013

January 2014	NGSX Pilot with Classroom Teachers	Science specialists from the STEM Centers at UAFS, UAM, and ASU-Delta, with support from additional STEM Center science specialists, facilitated the NGSX pilot session with science teachers. Approximately thirty teachers met for five days to complete the NGSX module. This module was designed to strengthen teachers' understanding of key physical science concepts, engage them in the scientific and engineering practices, and provide tools and strategies to support productive dialogue in the science classroom.	May 2014
February 2014	ADE Professional Development Science Program Manager Hired	Catherine Mackey became the K-12 Professional Development Program Manager for Science, a position vacant since 2009. The Program Manager develops statewide science professional development that supports the <i>Arkansas K-12 Science Standards</i> and works closely with the educational cooperative and STEM Center science specialists to move science education forward across Arkansas.	Ongoing
March 2014	Engagement of External Providers for Science Professional Development	ADE consulted other state educational agency science specialists to recommend science education research associates and external providers to inform the drafting of a systemic science professional development plan.	March 2014
April 2014	Contract with K-12 Alliance/WestEd	The ADE Professional Development Unit contracted with trainers from the K-12 Alliance at WestEd to provide training to the ADE, educational cooperative and STEM Center science specialists. The goal of this four-day training was to enhance each specialist's understanding of pedagogical techniques, such as questioning and discussion strategies, which will support classroom instruction that blends science content, science and engineering practices, and crosscutting concepts.	May 2014
May 2014	Training for Science Specialists on Statewide Workshop I and II	Catherine Mackey and Michele Snyder worked with educational cooperative and STEM Center science specialists to ensure fidelity in the implementation of statewide science professional development to be offered in the summer of 2014. This opportunity provided time for understanding of the professional development designed for Grades K-12 educators that must embrace the practices, disciplinary core ideas, and crosscutting concepts based on the <i>Framework for K-12 Science Education</i> .	May 2014

Summer 2014	Statewide Workshop II: Planning for New Science Standards	This two-day face-to-face professional development opportunity with follow-up support will be based on the professional learning provided through sessions with K-12 Alliance/WestEd. Teachers will be introduced to a conceptual flow model designed to build a deeper understanding of the scientific and engineering practices and crosscutting concepts. Science specialists will provide support for the use of the model by participating teachers throughout the 2014-2015 school year.	Ongoing
Summer 2014	Outreach to Partners	Catherine Mackey and Michele Snyder will reach out to various partner organizations across the state to increase awareness of the large body of research supporting the development of the new <i>Arkansas K-12 Science Standards</i> .	Ongoing
May 2014	Contract with External Provider	The ADE Professional Development Unit, in consultation with the Curriculum and Instruction Unit, will explore contracting with an external provider to provide training to the educational cooperative and STEM Center science specialists. The goal of this training would be to continue the enhancement of each specialist's understanding of pedagogical techniques, such as questioning and discussion strategies, to support classroom instruction that blends science content, science and engineering practices, and crosscutting concepts.	July 2014
August 2014	Training Teachers for the new Science Standards	The footage and all associated materials (handouts and PowerPoints) will be used from Dawson Coop PD training to make a course for the ArkansasIDEAS online portal.	May 2015
Fall 2014	Plan for Rollout of K-4 Specific Professional Development	ADE staff will work with ArkansasIDEAS and the existing Science Core Team, formed by the ADE Professional Development Unit, to develop a plan to roll out Grades K-4 professional development to support the implementation of <i>Arkansas K-12 Science Standards</i> . This training will begin in October 2015 and conclude by May 2016.	May 2016
Oct. 2014	PARCC Summit Pulaski Tech	Update on the development of the new Arkansas science standards to ERZ's and districts.	Fall 2014

Nov. 2014	ADE contracts with Brett Moulding, a member of the National Research Council's Board on Science Education and the committee that authored <i>A Framework for K–12 Science Education</i> to provide PD.	A three hour presentation entitled: "A Vision and Plan for Implementing Teaching Consistent with the Next Generation Science Standards," given November 7, 2014 as part of the Arkansas Curriculum Coordinators (ACC) Conference in Little Rock, Arkansas. The presentation was facilitated by Brett Moulding. The footage and all associated materials (handouts and PowerPoints) will be used to make a course for the ArkansasIDEAS online portal.	Nov. 2014
Nov. 2014	21st Century Community Learning Centers (CCLC) Afterschool Conference	Engaging in Science and Engineering Practices: A 1.5 hour presentation that engaged afterschool educators in developing and using models to investigate the properties of matter (sound waves). The presentation was facilitated by Michele Snyder and Cathy Mackey.	Nov. 2014
Nov. 2014	ADE science update at ACC	"The Journey to new Science Standards" November 7, 2014 as part of the Arkansas Curriculum Coordinators (ACC) Conference in Little Rock, Arkansas. The presentation was facilitated by Cathy Mackey and Michele Snyder. ADE shared <i>Arkansas K-12 Science Standards</i> implementation timeline with a focus on major shifts in curriculum, instruction, PD and assessment.	Fall 2014
Dec. 2014	ERZ Advisory Council Meeting Southern Arkansas University	Update on the NGSS to ERZ's and districts in the area.	Fall 2014

Winter 2015	Elementary Training for Science Specialists	ADE professional development unit is providing state-initiated science professional development designed to prepare educators for the implementation of the <i>Arkansas K-12 Science Standards</i> . The newest PD opportunities are being specifically designed to support elementary teachers. This includes a three-day, summer workshop followed by classroom follow-up as well as an elementary science safety awareness video. These opportunities will provide elementary teachers with tools and strategies to support high-quality, student-centered, science instruction while also including explicit connections to literacy and math. In addition, ADE is providing extensive professional development for the twenty-five science specialists housed at the educational cooperatives and university STEM centers; enabling them to be better prepared to support schools and teachers in making these transitions.	Winter 2015
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<p>Winter 2015</p>	<p>Statewide Planning for Grade-Band Specific Professional Development for New Science Standards</p>	<p>2015 State-initiated Science PD</p> <p>Planning for New Science Standards: K-12 Introduction to Three-Dimensional Learning: During this two-day session, participants will engage in hands-on experiences designed to enhance understanding of the Science and Engineering Practices, Crosscutting Concepts, and Core Ideas that will make up the new Arkansas K-12 Science Standards.</p> <p>Transitioning to New Science Standards: Targeted Support for Elementary Teachers: Participants will use strategies learned throughout this three-day session to support a student-centered, elementary classroom in which the three dimensions of the new Arkansas Science Standards are integrated with Common Core Literacy - a definite “win-win.”</p> <p>Transitioning to New Science Standards: Putting Practices into Place The new Arkansas Science Standards will require students to apply Science and Engineering Practices. This two-day session will engage participants in these practices using strategies designed to support deeper understanding of science concepts.</p> <p>Elementary Science Safety Awareness Video - in development</p>	<p>Ongoing</p>
<p>March 2015</p>	<p>Arkansas Association of Middle Level Education Conference 2015</p>	<p>Heidi Schweingruber Keynote Speaker -AETN Filmed Session Heidi Schweingruber, the new director of the Board on Science Education at the National Research Council, co-directed the study that led to the development of the report <i>A Framework for K-12 Science Education</i> (2011). She also authored <i>Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms</i> (2008) and <i>Surrounded by Science</i> (2010).</p>	<p>Ongoing</p>

Fall 2015	Planning for Grades 5-8 Summer Professional Development	ADE and ArkansasIDEAS will roll out grade-band specific professional development to support the implementation of Arkansas's new science standards. This training will begin in October 2015 and conclude by May 2016.	2016
Fall 2016	Revising and Updating Summer 2017 Professional Development	ADE and ArkansasIDEAS will roll out grade-band specific professional development to support the implementation of <i>Arkansas K-12 Science Standards</i> .	2017
Fall 2016	Planning for Grades 9-12 Summer Professional Development	ADE and ArkansasIDEAS will roll out grade-band specific professional development to support the implementation of <i>Arkansas K-12 Science Standards</i> . This training will begin in October 2016 and conclude by May 2017.	2017
January 2018	Revising and Updating Summer 2018 Professional Development	ADE and ArkansasIDEAS will roll out grade-band specific professional development to support the implementation of <i>Arkansas K-12 Science Standards</i> .	2018

# COMMUNICATIONS

**Successful implementation of *Arkansas's K-12 Science Standards* requires a focus on communication, a process stakeholder engagement, and sharing of accurate information that leads to a clearer, common understanding.**

<u>Start Date</u>	<u>Task Title</u>	<u>Description</u>	<u>Completion Date</u>
April 2012	Science Compressed Interactive Video (CIV)	An update was presented on science standards development in Arkansas.	2012
May 2012	Arkansas NGSS WIKI	The Arkansas NGSS WIKI was launched on <a href="http://www.arkansasngss.pbworks.com">www.arkansasngss.pbworks.com</a> and is used as a communication tool with educational cooperative and STEM Center science specialists across the state, as well as interested science educators.	Ongoing
November 2012	NGSS Public Draft Announcement	The release of last public draft of NGSS was disseminated through the CCSS ListServ.	2012
January 2013	NGSS Public Draft Announcement	The announcement for public comment period on the last public NGSS draft was disseminated through the CCSS ListServ.	2013
January 2013	Arkansas STEM Coalition Presentations	Michele Snyder was appointed to the Arkansas STEM Coalition Board of Directors and shared Arkansas's work as a lead state to develop the NGSS. Michele Snyder continues to update the board on the process for developing the <i>Arkansas K-12 Science Standards</i> .	Ongoing
April 2013	NGSS Released	The final version of NGSS was released.	2013
Spring 2013	Internal Communication: Learning Services Division Meeting	ADE Director of Curriculum and Instruction shared information about the development and implementation of new science standards with ADE Division of Learning Services (DLS) unit leaders. DLS unit leaders were encouraged to share information with staff in each unit. This will continue through the process of developing the <i>Arkansas K-12 Science Standards</i> .	Ongoing
July 2013	Frequently Asked Questions (FAQs)	FAQs about the <i>Arkansas K-12 Science Standards</i> were posted on ADE webpage ( <a href="http://tinyurl.com/kgovwba">http://tinyurl.com/kgovwba</a> ) and will be updated regularly beginning in the summer of 2014.	Ongoing

February 2014	Arkansas STEM Coalition Presentations	Dr. Tom Kimbrell addressed the Arkansas STEM Coalition to inform the group on the status of science standards. ADE staff will continue to provide updates on the status of the development and implementation of science standards at each meeting, as allowed.	Ongoing
April 2014	SBE Announced NGSS Endorsement	ADE announced the SBE's unanimous vote to endorse NGSS. Information was shared through CCSS ListServ, Twitter, and Facebook.	2014
April 2014	Science Standards Timeline Document	The <i>Arkansas K-12 Science Standards</i> timeline was released after SBE approval.	Ongoing
May 2014	Invitational Symposium: "Next Generation Science Teacher Preparation in Arkansas"	Michele Snyder presented plans for <i>Arkansas K-12 Science Standards</i> at the Science Invitational Symposium at the University of Central Arkansas. The meeting was sponsored by the Arkansas STEM Coalition and the Parks Family Professorship in Science Education, University of Arkansas Fayetteville.	May 2014
June 2014	Updates to the State Board of Education	Beginning in June 2014, ADE staff will provide updates on progress toward the development and implementation of the <i>Arkansas K-12 Science Standards</i> to the State Board of Education at each monthly meeting.	Ongoing
June 2014	Briefing of State Legislature	ADE representatives have been invited to brief the House and Senate Education Committees to discuss the timeline for development and implementation of the <i>Arkansas K-12 Science Standards</i> .	2014
June 2014	Launch Webpage	The <i>Arkansas K-12 Science Standards</i> page and information will be posted on <a href="http://www.arkansased.org">www.arkansased.org</a> .	Ongoing
August 2015	Posting of Science Logo	Logo for <i>Arkansas K-12 Science Standards</i> will be posted on <a href="http://www.ideas.aetn.org">www.ideas.aetn.org</a> . This site will be used to house professional development created during this plan.	Ongoing

June 2014	Science Update Back-to-School Video	ADE Curriculum and Instruction and Professional Development Units will work with ArkansasIDEAS to film and post a ten-minute video informing schools on the process of developing science standards and the standards implementation timeline. The video will then be posted on the science page of the ADE website and a DVD copy mailed to every district superintendent and educational cooperative.	January 2015
August 2014	Newsletter or Electronic Updates	ADE will create and disseminate a newsletter or electronic updates highlighting the progress made in the work to develop the <i>Arkansas K-12 Science Standards</i> . Updated information will be posted on the ADE website with other related information.	Ongoing
Fall 2014	Round Table Discussions with Directors and TCCs from Educational Cooperatives	ADE Curriculum and Instruction and Professional Development Units will hold regular, interactive, remote meetings with educational cooperatives and STEM Center Directors and TCCs to maintain dialogue related to the new science standards.	Ongoing
Fall 2014	Key Stakeholders Engagement	Key stakeholders in business, informal science educators, and ACE educators will be identified and formally asked to engage in this work.	Ongoing
Fall 2014	SBE updates	Address the SBE with update on progress made so far with the K-12 science standards development process, PD and assessment.	Ongoing
Fall 2014	Communications Toolkit	Achieve, Inc. and Widmeyer Communications will work with ADE to provide communication support to stakeholders.	Ongoing
November 24, 2014	The Northwest Arkansas Times	Working on Standards; Set to be Reviewed by the Education Board in the Spring. Article by Rose Ann Pearce. Article included quotes from a Vandergriff Elementary science teacher and the Fayetteville School District science coordinator about the NGSS and the engineering standards being implemented in classrooms. Both of these educators are members of the K-8 Science Standards Committee working to write the new K-8 portion of the new standards. Michele Snyder was also quoted on the goals of the committee and the role of the SBE in the standards development process in Arkansas.	November 2014
November 2014	SBE	Dr. Francis Eberly, NASBE Deputy Director, came to speak to the SBE on the development of the NGSS from the Framework to the writing process to the publishing of the final documents as part of the NASBE NGSS grant.	November 2014

December 14, 2014	Arkansas Democrat Gazette	Education Notebook Op Ed article titled: Experts Tout New Science Standards by Cynthia Howell. M. Snyder is quoted on what the benefits of the new standards will bring to the science learning experiences of students and what will be different about the new standards compared to the current 2005 Arkansas Science Curriculum Frameworks.	December 2014
December 2014	SBE	Dr. James Gates, recipient of the National Science Medal and Regents Professor of Physics at the University of Maryland — and Maryland State Board of Education member, addressed the audience at the Clinton School of Public Service ( <a href="http://clintonschool.uasys.edu/">http://clintonschool.uasys.edu/</a> ) here in Little Rock on the Next Generation Science Standards. The session was titled : “Next Generation Science Standards: A Key to the Next Generation of American Jobs.” Dr. Gates made an eloquent argument in support of the standards. This event was an excellent opportunity for building capacity for the NGSS among recently elected education committee legislators, community members, educators, and State Board members.	December 2014
2015	Presentation at Education Conferences	ADE Curriculum and Instruction and Professional Development Units will work through out to share progress made in the development of the <i>Arkansas K-12 Science Standards</i> .	Ongoing
September 2015	ArkansasIDEAS Exemplary Science Video Series	ADE, in cooperation with ArkansasIDEAS, will video multiple exemplary science lessons taught in Arkansas classrooms with an initial focus on Grades K-4 lessons.	Ongoing

## Partners in the Work

<u>Date</u>	<u>Task Title</u>	<u>Partner Organizations and Participants</u>
January 2012	NGSS Broad-based Stakeholder Committee	<p>Harding University, Drew Central School District, Arkansas Advanced Initiative for Math and Science (AAIMS), UAFS STEM Center, Arkansas Science Teachers Association (ASTA), AT &amp; T, Rogers School District, Harrison School District, UAF STEM Center, ASU STEM Center - Delta, Nettleton School District, Alpena School District, Pocahontas Community College, AR STEM Coalition, Conway School District, Stuttgart School District, Sheridan School District, Magnolia School District, El Dorado School District, ASU STEM Center - Rural, UAF College of Biology, UAM College of Science, UALR U-Teach, UAF College of Engineering, Arkansas Career Education (ACE), EAST Initiative, Arkansas Natural Heritage Commission, Arkansas Science &amp; Technology Authority (ASTA), UCA College of Biology, Clarksville School District, HSU STEM Center, Arkansas Game and Fish Commission</p>
June 2013	Arkansas NGSS Review Committee	<p>UCA College of Natural Sciences and Mathematics, Bentonville School District, Greenbrier School District, Rogers School District, Mayflower School District, West Memphis School District, UAF U-Teach, Arkansas Distance Learning School (Virtual Arkansas), Monticello School District, Little Rock School District, Harrisburg School District, Star City School District, Fort Smith School District, Mineral Springs School District, Barton-Lexa School District, Osceola School District, Lake Hamilton School District, Atkins School District, McGehee School District, Mountain Home School District, Bryant School District, Benton School District, Hot Springs School District, UALR College of Education, UAFS College of Natural Sciences, North Little Rock School District, North Arkansas College/NorthArk Technical Center, Norfolk School District, Gentry School District, White County School District, UAMS, UAF College of Geosciences, Jonesboro School District</p>

<p>2014</p>	<p>Arkansas K-8 Science Committee</p>	<p>Health and Wellness Elementary School/Jonesboro School District, University of Arkansas, Monticello, Sheridan Elementary/ Sheridan School District, Ahlf Junior High/Searcy School District, Fort Smith Public Schools, Ledbetter Intermediate/Farmington School District, B. T. Washington Elementary/Little Rock School District, Camden Fairview School District, Robert F Morehead Middle School/Dollarway School District, Rogers School District, Northwest Arkansas Education Service Cooperative, Forest Heights STEM Academy/ Little Rock School District, Wilson Intermediate School/ Malvern School District, El Dorado Public Schools, Black River Technical College, FJHS Science/Bentonville School District, STEM Center at Henderson State University, J.O. Kelly Middle School/Springdale School District, Goza Middle School/Arkadelphia School District, Lynch Middle School/Farmington School District, H. L. Lubker Elementary/ Bald Knob Schools, Hamburg Middle School/Hamburg, University of Arkansas-Fayetteville, Central Elementary/ Magnolia School District, University Heights Elementary/Nettleton School District, Vandergriff Elementary/ Fayetteville School District, Institute for Math and Science Education/University of Arkansas at Fort Smith, Northside Elementary /Cabot School District, Barton Junior High School/El Dorado, eStem Public Charter Schools, Arrie Goforth Elementary School/Norfolk School District, DeQueen Mena Education Cooperative, Glenview Elementary/North Little Rock School District, University of Central Arkansas, Fayetteville School District, Hellstern Middle School/Springdale School District, Maumelle Middle school/Pulaski County Special School District, Wonder Elementary /West Memphis</p>
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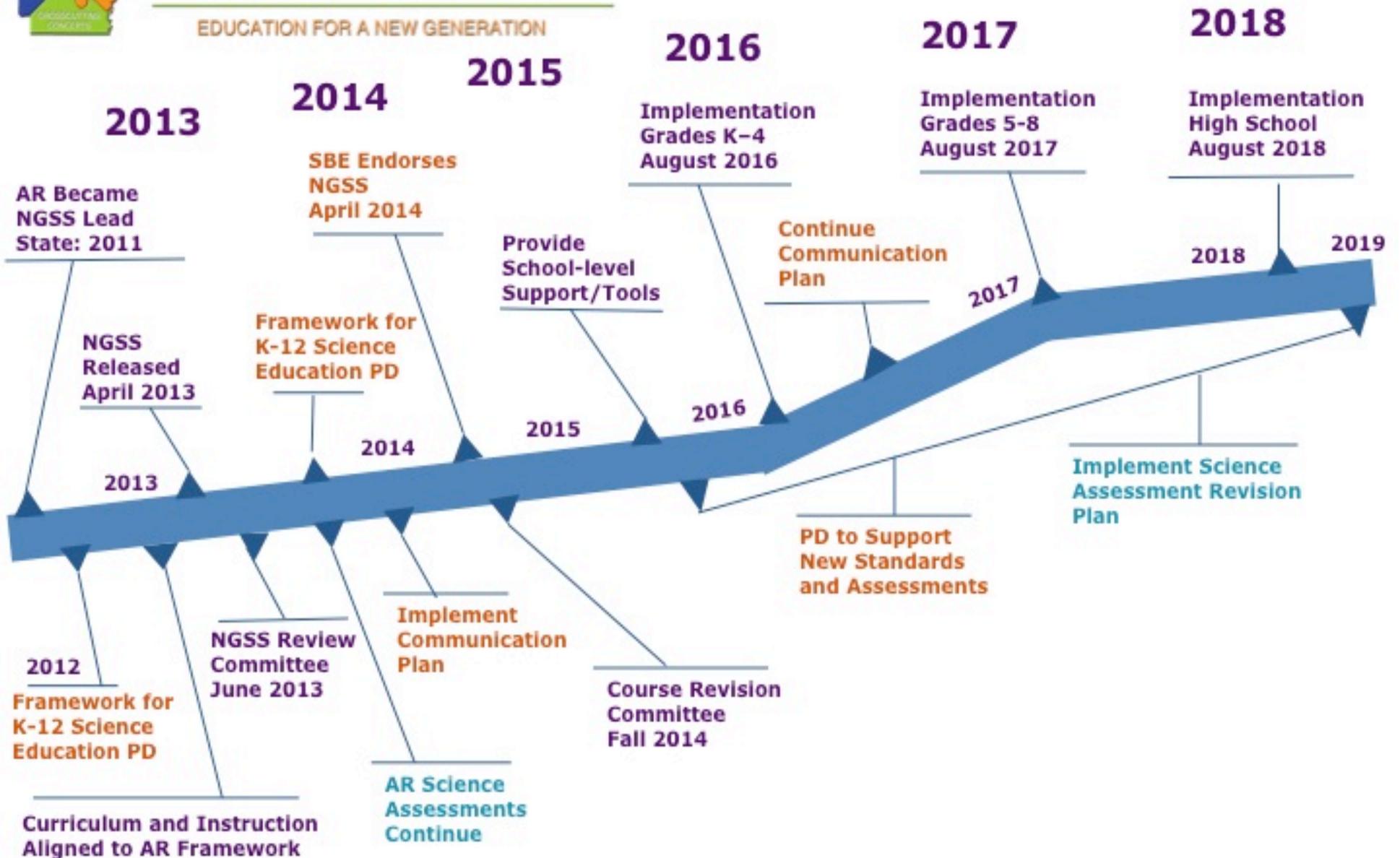
Ongoing	Arkansas Education Service Cooperatives	Arch Ford Education Service Cooperative/Plummerville, Arkansas River Education Service Cooperative/Pine Bluff, Crowley's Ridge Education Service Cooperative/Harrisburg, Dawson Education Service Cooperative/Arkadelphia, DeQueen/Mena Education Service Cooperative/Gillham, Great Rivers Education Service Cooperative/Helena-West Helena, Northcentral Arkansas Education Service Cooperative/Melbourne, Northeast Arkansas Education Service Cooperative/Walnut Ridge, Northwest Education Service Cooperative/Farmington, Ozarks Unlimited Resource Education Service Cooperative/Valley Springs, South Central Education Service Cooperative/Camden, Southeast Arkansas Education Service Cooperative/Monticello, Southwest Arkansas Education Service Cooperative/Hope, Western Arkansas Education Service Cooperative/Branch, Wilbur D. Mills Education Service Cooperative/Beebe
Ongoing	Arkansas STEM Centers	Arkansas State University – Delta/ASU Delta STEM Education Center, Arkansas State University – Rural/ASU Rural STEM Education Center, Arkansas Tech University/ATU STEM Institute, Harding University/STEM Center for Mathematics and Science Education, Henderson State University/The STEM Center at Henderson State University, Southern Arkansas University/Southern Arkansas University STEM Center for K-12 Education, University of Arkansas/STEM Center for Math and Science Education (CMASE), University of Arkansas at Fort Smith/Institute for Math and Science Education, University of Arkansas at Little Rock/Arkansas Partnership for STEM Education, University of Arkansas at Monticello/UAM STEM Center, University of Central Arkansas/UCA Institute for STEM Professional Development and Education Research, University of Arkansas at Pine Bluff/UAPB Department of Biology-STEM Center
Ongoing	Arkansas Educational Renewal Zones (ERZ)	University of Arkansas/Northwest ERZ, University of Arkansas at Fort Smith/Western ERZ, Henderson State University/Southwest ERZ, Southern Arkansas University/Southern ERZ, University of Arkansas at Monticello/Southeast ERZ, Arkansas State University/Northeast ERZ



# ARKANSAS K-12 SCIENCE STANDARDS

EDUCATION FOR A NEW GENERATION

## Science Standards Timeline



Curriculum and Instruction

Assessment

Professional Development

