

Arkansas K-12 Science Standards



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K-12 SCIENCE STANDARDS

EDUCATION FOR A NEW GENERATION



Key questions to be addressed during this session...

- Why are teachers the best messengers on science standards and improved science education?
- When and how should teachers communicate about science education?
- What do parents want and need to hear about improved science education?



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When teachers talk, people listen

**72% of adults trust and have confidence
in public school teachers**

2013 PDK/Gallup Poll of Public's Attitudes Toward the Public Schools



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Teachers are seen as experts

Teachers have an understanding of

- the science content to be taught.
- the pedagogy needed to teach science well.
- the students in their classrooms.



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WHAT DO PARENTS WANT AND NEED TO HEAR ABOUT IMPROVED SCIENCE EDUCATION?



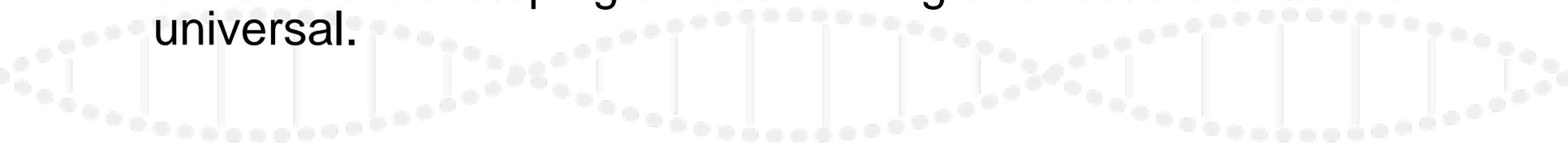
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Messages that most resonate with parents

- ***It has been nearly two decades since the last update.*** This compelling argument also generates a sense of urgency for implementing the new standards.
- ***The U.S. and our kids need to be able to compete in a global economy.*** Only 32% of Arkansas students met the ACT College Readiness Benchmark in Science. STEM skills are in high demand because employers cannot find the talent they need to stay competitive.
- ***The new standards will benefit BOTH those going to college and those going directly into the workforce.*** The benefits of developing critical thinking and real-life skills are universal.



Messages that most resonate with parents – cont'd...

- **Teachers were a big part of the development of the Arkansas K-12 Science Standards and NGSS.** Science broad-based committees in the 26 lead states worked with 41 writers, all of whom were education experts and more than half of whom were practicing K-12 teachers (two were Arkansas middle school teachers), to develop the standards. Arkansas teachers also provided comments to the draft standards during the two public review periods.
- **The public provided a lot of feedback on the Arkansas K-12 Science Standards and NGSS.** The draft AR K-8 standards received 135 comments. The draft NGSS standards also received comments from more than 10,000 individuals during two public review periods. These comments came from teachers, school and school district discussion groups, scientific societies, parents, and students.

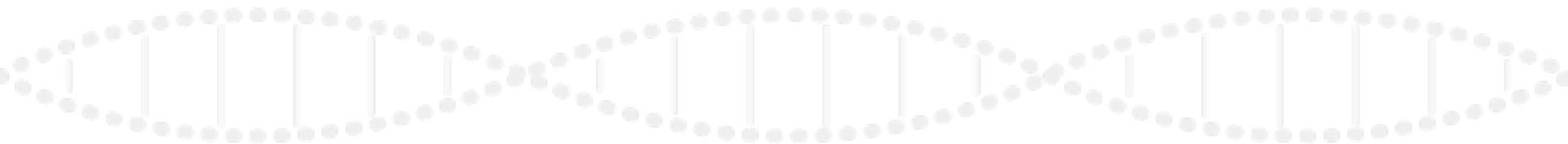


Parents and Teachers need the basic questions answered

- Why?
- What?
- How?
- When?

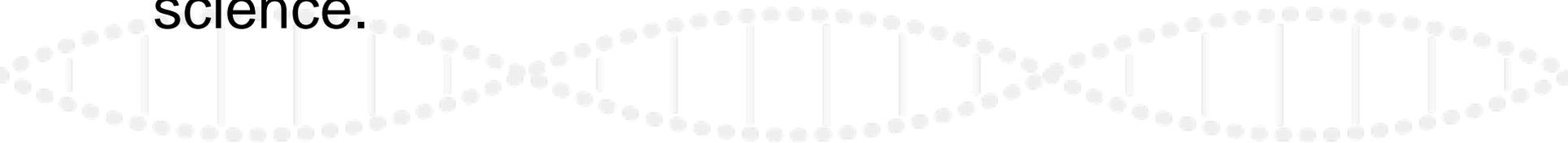
Why do we need to improve science instruction and raise standards?

- It has been nearly 20 years since the National Research Council and the American Association for the Advancement of Science produced their reports from which the 2005 AR Science Curriculum Frameworks are based.
- There have been major advances in science and our understanding of how students learn science.
- Our students deserve to learn the most current science available, using the most effective methods.



What are the Next Generation Science Standards (NGSS)?

- The NGSS are a new set of K–12 science standards developed by states. Arkansas was one of the 26 lead states.
- The NGSS identify science and engineering practices and content that all K–12 students should master in order to prepare for success in college and 21st century careers.
- The NGSS are based on the most current scientific research and on how students best learn science.

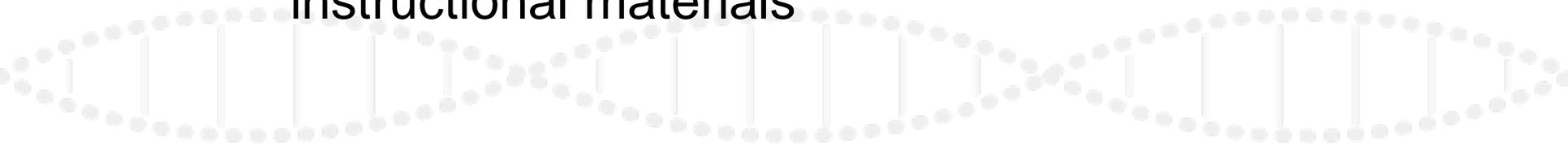


How was NGSS used to create the Arkansas K-12 Science Standards?

- The Arkansas K-12 Science Standards are a new set of science standards developed by K-20 AR teachers, principals, and instructional facilitators. The AR standards are grounded in the NGSS performance expectations (standards) organized by grade or course.
- AR teachers reviewed and added specific clarification statements and assessment boundaries. Connections to ELA and math standards were aligned to each grade.
- AR teachers also wrote learning progressions and overviews of what students need to know and be able to do in each grade or course.

When will the Arkansas K-12 Science Standards be implemented?

- Grades K-4 implement fall of 2016
- Grades 5-8 implement fall of 2017
- Grades 9-12 implement fall of 2018
- Districts, principals, instructional facilitators, and teachers should be creating a transition plan
 - Professional development for teachers
 - Development of aligned curriculum and instructional materials



How will science instruction change with the new standards?

SCIENCE EDUCATION WILL INVOLVE LESS

- Rote memorization of facts and terminology
- Teachers posing questions with only one right answer
- Worksheets

SCIENCE EDUCATION WILL INVOLVE MORE

- Facts and terminology learned as needed while developing explanations and designing solutions supported by evidence-based arguments and reasoning
- Students discussing open-ended questions that focus on the strength of the evidence used to generate claims
- Student writing of journals, reports, posters, and media presentations that explain and argue

How will science instruction change with the new standards? cont'd

SCIENCE EDUCATION WILL INVOLVE LESS

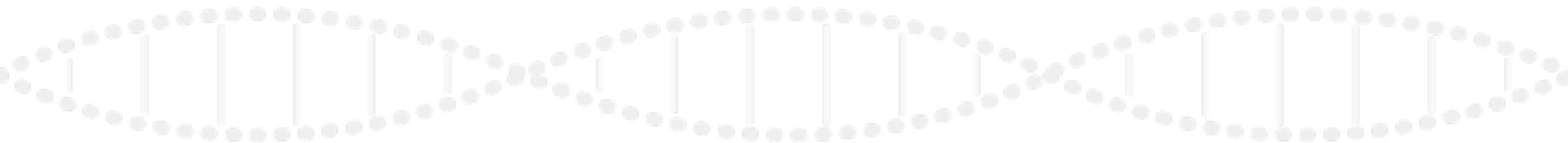
- Learning of ideas disconnected from questions about phenomena
- Oversimplification of activities for students who are perceived to be less able to do science and engineering

SCIENCE EDUCATION WILL INVOLVE MORE

- Systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned
- Provision of supports so that all students can engage in sophisticated science and engineering practices

What are three strategies in communicating about the Arkansas K-12 Science Standards?

- Have a central message and three supporting points about the standards.
- Know your audience.
- Use common language.



Central message and 3 supporting points by a teacher to a parent

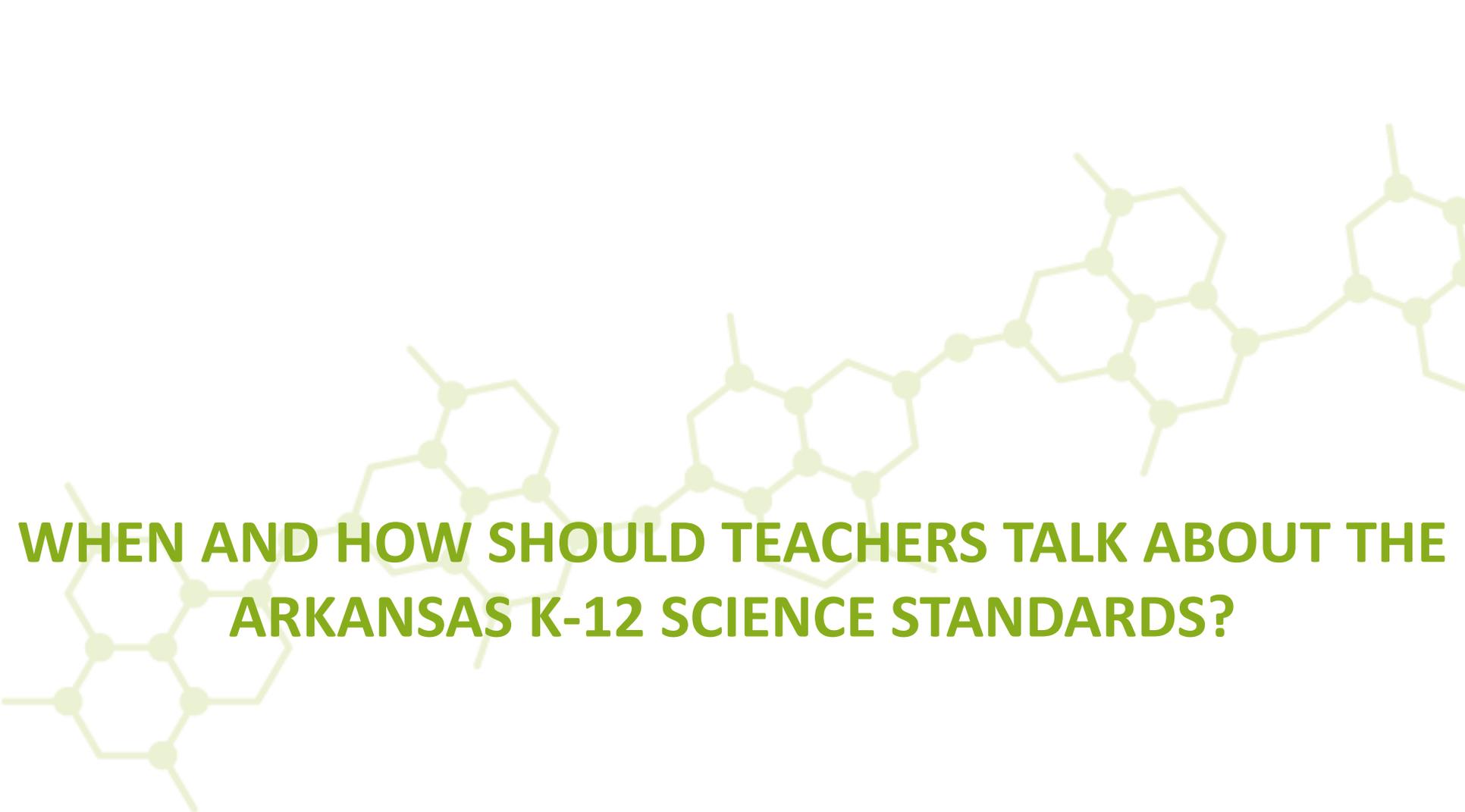
The Arkansas K-12 Science Standards will ensure your kids are better prepared for their future.

1. ...will prepare your children to think, ask questions, research, and apply skills to real-world situations.
2. ...will prepare your children to be well informed citizens on issues that will impact them now and in the future.
3. ...are highly engaging, student-centered standards based on the most current research on how kids learn science best.

Central message and 3 supporting points by a teacher to another educator

The Arkansas K-12 Science Standards will ensure students are better prepared for college and career pursuits.

1. ...will prepare your students to problem solve, ask questions, research, and apply skills to real-world situations.
2. ...are highly engaging, student-centered standards based on the most current research on how students learn science best.
3. ...will provide more choices in high school science course work, while providing opportunities for advanced STEM studies.



WHEN AND HOW SHOULD TEACHERS TALK ABOUT THE ARKANSAS K-12 SCIENCE STANDARDS?



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Utilize existing parent-teacher communication opportunities

- **Open Houses or Curriculum Nights:** Set up stations around the school with hands-on experiences that parents and students can share
- **Parent-Teacher Conferences:** Mention the Arkansas K-12 Science Standards and provide an informational handout
- **PTA Meetings:** Model a lesson and provide general information about the Arkansas K-12 Science Standards

Create new opportunities to share information with parents

- **Science Saturday Showcases:** Host a hands-on science showcase and invite parents and community members to experience the science education their students are receiving
- **Science Suppers or Breakfasts:** Hold a potluck for students and their families and have students show what they are doing in science class
- **School and Local Library Events:** Partner with librarians to host events that highlight science education and resources



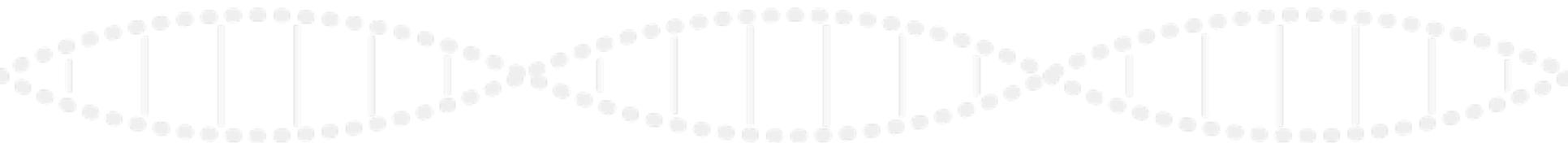
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Find tools on the Arkansas K-12 Science Standards website

- [Communication Tools](#)
- [Implementation Tools](#)
- [Frequently Asked Questions \(FAQs\)](#)
- [New K-12 Science Standards Video](#)



QUESTIONS?



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For more information about the standards

- Review the Arkansas K-12 Science Standards website-

<http://www.arkansased.gov/divisions/learning-services/curriculum-and-instruction/arkansas-k-12-science-standards>

- Review the Arkansas K-12 Science Standards for Grades K-8-

<http://www.arkansased.gov/divisions/learning-services/curriculum-and-instruction/curriculum-framework-documents/science>

- Review the NGSS website –

<http://www.nextgenscience.org/next-generation-science-standards>



Reach out to science specialists around the state.

- Contact science specialists at local [Education Cooperatives](#) or [STEM Centers](#)
- Contact Michele Snyder, ADE Science Specialist Michele.snyder@arkansas.gov
- Contact Cathy Mackey, ADE Science Professional Development Catherine.mackey@arkansas.gov
- Contact Ann Finch, ADE Science Assessment Ann.finch@arkansas.gov



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