



## FAQ: Oklahoma Academic Standards for Science

### (1) Why do we need new state standards for science?

The *Priority Academic Student Skills for Science (PASS)* were originally developed in 1993 and have been revised periodically (1997, 2002, 2006, 2011) and have received much criticism from **Oklahoma educators** and **independent research organizations**.

- **Educators across the state shared criticisms of the PASS standards.** The following criticisms of the PASS standards have been documented below and have been addressed in the new Oklahoma Academic Standards for Science:
  - the current standards **do not integrate science processes with science content**;
  - the current standards **do not link to related math and literacy standards**;
  - the pacing of the current standards from one grade level to the next is **slow with few changes**;
  - the current standards are **too vague**, especially related to process standards;
  - the current standards **do not contain earth and space science** standards for the high school level.
  - the current standards **only address engineering at 8th grade** for middle school and **Physical Science and Physics** for high school.
  - Read the current PASS Standards:  
<http://ok.gov/sde/sites/ok.gov.sde/files/C3%20PASS%20sci.pdf>
- **The Fordham Institute evaluated every state's science standards in their 2012 report, *The State of the State Science Standards*, and gave the Oklahoma PASS standards a grade of "F".** Page 7 shows an overview of every state's rating and page 145 begins the analysis of Oklahoma's PASS standards revised and passed in 2011.
  - **Content and Rigor: 1 out of 7**
  - **Clarity and Specificity: 1 out of 3**
  - Read the Fordham Institute's report: <http://www.edexcellence.net/publications/the-state-of-state-science-standards-2012.html>

### (2) How were the new Oklahoma Academic Standards for Science Developed?

The standards revision process **had the input of over 500 Oklahomans through three levels of committees and numerous focus groups that were held around the state**. Additionally, two public comment periods were held where 23 comments were received. All comments were evaluated by the Writing Team and appropriate adjustments were made.

- **Read the details regarding the process on pages 4-5** of the New Oklahoma Academic Standards for Science:  
<http://www.ok.gov/sde/sites/ok.gov.sde/files/Oklahoma%20Academic%20Standards%20for%20Science.pdf>
- The revision process took nearly two years and was **more extensive than any previous standards revision process**.
- Nearly 60 representatives from K-12 education, higher education, career technology, scientists,

engineers, and parent and community members from across the state served on Writing and Draft Committees for the revision of the Oklahoma Academic Standards for Science.

- Committee members carefully considered feedback from over 500 educators and community members who provided feedback at regional meetings and through two public draft periods.
- The Oklahoma revision committees utilized the new *Next Generation Science Standards* (NGSS) in developing the proposed new science standards for Oklahoma because:
  - NGSS was determined by the committee to be a quality resource developed by trusted bodies of science and science education utilized in previous Oklahoma science standards revision processes
  - NGSS was based on the most current research in science education
  - ACT and NAEP were aligning their tests to NGSS
- **The revision committee did not adopt NGSS**, but made significant changes that make the Oklahoma standards distinct from NGSS.
- The Writing Committee retained what Oklahoma experts considered the best features of the *NGSS* and *A Framework for K-12 Science Education*, such as the integration of scientific and engineering practices with science content.

### (3) How are the new Oklahoma Academic Standards for Science relevant to Oklahoma and preparing students for STEM Careers in Oklahoma ?

The new Oklahoma Academic Standards for Science include **scientific and engineering practices** and **science topics** that are directly related to Oklahoma’s 5 Key Industry Ecosystems.

- The new Oklahoma Academic Standards for Science include new topics of exploration related to Oklahoma: (1) **Waves and their applications in technologies** for information systems such as using fiber optic cable to transmit light pulses, radio wave pulses in wifi devices, and the use of stored binary patterns to make sound or text on a computer; (2) **Geological processes** that lead to distribution of natural resources like oil, natural gas, and mineral deposits in some areas and diverse soil profiles that support a range of agricultural crops. and; (3) Technologies that assist in collecting data to enable weather events to be forecasted and **engineering solutions to mitigate their impact on humans like tornado shelters or reinforced building structures**.
- The new Oklahoma Academic Standards for Science **integrate engineering at each grade level**. The **PASS standards only mention engineering in one sub-standard for 8th grade and one standard in physical science and physics in high school**. Since physical science and physics are elective science classes, students could go through their entire K-12 science experience with exposure to engineering once at 8th grade.
- The new Oklahoma Academic Standards for Science emphasize **students doing science to learn science by engaging students in science and engineering practices and encouraging students to develop critical thinking skills and reasoning skills**, which are identified as critical by higher education, business and industry in Oklahoma.

| PASS Process Skills          | New Science & Engineering Practices                     |
|------------------------------|---|
| 1. Observe and measure       | 1. Asking questions and defining problems               |
| 2. Classify                  | 2. Developing and using models                          |
| 3. Experimental Design       | 3. Planning and carrying out investigations             |
| 4. Interpret and Communicate | 4. Analyzing and interpreting data                      |
| 5. Model                     | 5. Using mathematics and computational thinking         |
| 6. Inquiry                   | 6. Constructing explanations and designing solutions    |
|                              | 7. Engaging in argument from evidence                   |
|                              | 8. Obtaining, evaluating, and communicating information |

#### (4) Are there Common Core Standards for Science?

There are **not Common Core standards for Science**, nor are there Common Core standards for Science in development.

- While there is a Science Literacy strand in the Common Core State Standards (CCSS), it is **only a component of the English/Language Arts Standards** and addresses science literacy skills in reading, writing, speaking, listening, and language in science for grades 6-12.
- Unlike the CCSS Science Literacy strand, the **Oklahoma Academic Standards for Science include science content**.
- For decades different science-related bodies have developed various science standards that inform our state standards. Since they were initially developed in 1993 the *Priority Academic Student Skills* were informed by the 1993 *Benchmarks for Scientific Literacy* from the American Association for the Advancement of Science and later informed by the 1996 *National Science Education Standards* from the National Research Council, with regular revision cycles of specific changes and adaptations by Oklahoma educators.
- Beginning in 2011, 26 states led an effort to develop better science standards, working with the National Science Teachers Association, National Research Council, American Association for the Advancement of Science, and other partners to develop the *Next Generation Science Standards* by 2014. *The Next Generation Science Standards* were informed by the National Research Council's *A Frameworks for Science Education K-12*. The initiatives were not affiliated with the Common Core State Standards, which focus on English/Language Arts and Mathematics.
- Although Oklahoma did not participate as a lead state in the development of the *Next Generation Science Standards*, numerous Oklahomans did participate in providing feedback to their development through two nation wide public drafts.