

STATE ADOPTIONS OF SCIENCE STANDARDS SINCE 2013

A majority of states have adopted new science standards since 2013, the year the Next Generation Science Standards (NGSS) were introduced. Several states adopted NGSS as a whole, while others used NGSS as a guide but made their own modifications.

STATE ADOPTIONS OF NEXT GENERATION SCIENCE STANDARDS: Arkansas, California, Connecticut, Delaware, District of Columbia, Hawaii, Illinois, Iowa, Kansas, Kentucky, Maryland, Michigan, Nevada, New Hampshire, New Jersey, New York, Oregon, Rhode Island, South Dakota, Vermont, Washington, West Virginia, and Wyoming

On May 23, 2013, the **Rhode Island** Board of Education voted unanimously to adopt the Next Generation Science Standards. Peter McLaren, a spokesperson for the Department of Education, was pleased that his state was the first to accept NGSS. He said it will take some time to integrate the new standards. “We are going to go with a four-year timeline. All of the systems are going to be affected by this: professional development, instruction, curriculum, assessment, preservice [undergraduate teacher education], materials and resources.... Nobody wants to rush in.”

There was little opposition to NGSS in Rhode Island, which is of course a solid blue state. The Fordham Institute had rated the state’s previous standards a “D,” compared to a mediocre “C” rating for NGSS. Fordham said that Rhode Island’s previous standards were similar in quality to NGSS, *i.e.*, not very good.

The **Kentucky** Board of Education adopted NGSS unanimously on June 5, 2013, becoming the second state to do so. The Department of Education plans to implement the new standards in the 2014-2015 school year. Unlike Rhode Island, Kentucky has experienced some opposition to NGSS. State Sen. Mike Wilson, Chairman of the Senate Education Committee, has publicly expressed concern about NGSS – particularly regarding the coverage of climate change and evolution. In a May 23 editorial, Wilson said the “standards place substantial emphasis on teaching climate change and there is considerable discussion describing human activities as major factors in global warming.” Wilson pointed out that there are many climate scientists who dispute this human connection.

Wilson also stated that the “standards make it clear that evolution is fundamental to understanding the life sciences.” Wilson described as “supposition” the theory that “one species may evolve into a different species.” He concluded his editorial: “Standards should encourage teachers to create and foster an environment that promotes critical thinking skills, logical analysis, and open and objective discussion of the advantages and disadvantages of multiple theories.” Kentucky’s current standards were rated “D” by the Fordham Institute. Fordham said that the state’s standards were “clearly inferior” to NGSS.

The Kentucky Board of Education’s approval of NGSS may not be the last word in the matter. A required public hearing on the standards was held on July 23, 2013. Both proponents and opponents spoke on the measure. The complaints were mostly related to the standards on evolution and climate change. On August 8 the Kentucky Board approved a Statement of Consideration that sent the standards to the legislature.

The state Administrative Regulation Review Subcommittee then reviewed the standards and voted 5-1 on Sept. 11 to *reject* them. Subcommittee co-chair State Sen. Ernie Harris said that most of the comments he received from the public were against adoption of NGSS. Two other State Senators and two Representatives joined Harris in voting “no.”

Shortly after the vote, also on Sept. 11, Kentucky Gov. Steve Beshear announced that he “plans to implement the new Kentucky Next Generation Science Standards under his own authority.” The governor has the legal power to do this, so at this point Kentucky’s implementation plans will continue. However, the Kentucky General Assembly could vote to override his decision when they reconvene in 2014.

On June 11, 2013, the **Kansas** State Board of Education voted 8-2 to adopt NGSS. In 2013 Kansas experienced considerable opposition to the Common Core English and Math standards, but vocal opposition to the science standards has been relatively low key. A bill (HB 2391) was introduced during the 2013 legislative session that would delay implementation of Common Core in the state and also delay adoption of NGSS. The bill was vigorously debated in the Kansas Legislature and was eventually defeated by a narrow margin.

The adoption process for the science standards began at the May 14 meeting of the State Board of Education. Greg Lassey, a Director of COPE, spoke during the Citizens Open Forum. [Mr. Lassey’s remarks](#) stated that the expected effect of the *Framework* and *Standards* would be to establish a materialistic, non-theistic worldview. Lassey provided the Board with copies of COPE’s reports describing problems with NGSS. He invited the Board and education officials to meet with COPE representatives to discuss COPE’s analysis of NGSS in detail. Lassey was the

only person to speak on the science standards, although at least twenty other speakers urged the Board to suspend implementation of the Common Core English and Math standards.

Later in the May 23 meeting, employees of the Kansas Department of Education spoke in favor of NGSS. Matt Krehbiel, Science Program Consultant, gave a PowerPoint presentation explaining that NGSS was designed to help children, “using science to make sense of the world.” One Board member asked the Department what areas of NGSS were likely to cause controversy. The answer was “evolution” and “climate change.” A department respondent made the telling comment that “we can’t consider the supernatural.” This was essentially an admission that the science standards employ methodological naturalism and are therefore functionally atheistic.

Consideration of NGSS was continued at the June 11 Board meeting. Rex Powell, a member of COPE, spoke on NGSS during the Citizens Open Forum. [Powell’s remarks](#) were similar to those of Greg Lassey on May 23, but Mr. Powell noted that neither the State Board nor Department of Education had contacted Mr. Lassey to discuss COPE’s concerns. Powell expressed surprise at this, since COPE’s complaints raise serious religious and constitutional issues. Six other speakers presented remarks in support of the science standards. None of these presenters addressed concerns raised by Mr. Lassey or Mr. Powell.

Later in the meeting Mr. Krehbiel gave another PowerPoint presentation in support of NGSS, essentially repeating his remarks from the May 23 meeting. Krehbiel explained that the next step in the process after adoption would be to develop curriculum and assessments for the standards; this could take three or four years.

After a motion was made to adopt the science standards, Board discussion ensued. Board member Kenneth Willard took the floor. He explained that a week earlier he had circulated a memo to the Board and Department that listed his concerns with the *Framework* and *Standards*. His [remarks](#) were then read into the record. Willard emphasized the lack of objectivity and religious neutrality in the standards, particularly in the coverage of biological origins (evolution) and environmentalism (climate change). He opined that this could result in “a possible constitutional challenge.” Willard urged the Board to respond to the issues raised by COPE before acting on the motion to approve the standards.

Board Chairman Jana Shaver recognized that Mr. Willard’s concerns had not been addressed, and she wondered if they should postpone a vote on the motion to adopt NGSS. Most members of the Board thought that the vote should be taken that day. The Board then voted 8-2 to adopt the standards, with Willard and John Bacon dissenting.

Two days later (June 13, 2013), the Fordham Institute issued its report on NGSS. According to a [report by the Associated Press](#), Kansas made a mistake in replacing “B”-rated standards with the NGSS, which barely rates a “C”: “Kansas is replacing some of the nation’s strongest science standards for public schools with weaker multistate guidelines....”

Commenting on the Kansas Board’s decision, Fordham President Chester Finn said: “We think that the ones [standards] you are ushering out the door are superior. I hope you give them a very nice going-away party.”

The **Maryland** State Board of Education unanimously approved NGSS on June 25, 2013, making it the fourth state to do so. Full implementation is not expected until the 2017-2018 school year. Dr. S. James Gates, a physics professor and State Board member, commented that “these standards will make it [science] an integral part of education for every student.” He continued with remarks that might be a bit optimistic and overly dramatic: “These standards provide the foundation for the jobs of tomorrow. They can be the key to unlocking the American dream.”

Maryland’s previous science standards were given a “B” rating by Fordham, who stated that the standards were “clearly superior” to NGSS. So Maryland becomes another state turning in “B”-rated standards for the “C”-rated NGSS.

Also on June 25, the **Vermont** State Board of Education adopted NGSS by a unanimous vote. “Adopting the standards is a step in the right direction,” opined Secretary of Education Armando Vilaseca. “Along with the adoption of the Common Core State Standards, NGSS is another tool for our schools.” State Board Chair Stephan Morse added: “We share the goal of constantly striving to better prepare our kids for college and the global workforce.” Gov. Peter Shumlin believes NGSS may eventually help businesses to fill technical jobs in the state. He opined that the new standards could help to “keep Vermont’s schools on the leading edge nationwide.”

Vermont’s previous science standards received a “C” rating from Fordham, which is the same grade given to NGSS.

On September 4, 2013, the **California** State Board of Education unanimously adopted NGSS. State Superintendent Tom Torlakson said “the adoption of the Next Generation Science Standards in California marks a crucial step in making sure our students are prepared to succeed after they leave our classrooms. Scientific information and technology have changed remarkably since the last time California updated its science standards, and how and what we teach have to change with them.” The old California standards date back to 1998, so an update certainly seems

reasonable. However, the 1998 standards were rated “A” (the best in the nation) by Fordham, so it seems odd that they are being replaced by the “C”-rated NGSS.

Torlakson said the next step is putting together a Strategic Leadership Team to form a development plan for implementation of NGSS. This will include a timeline, a science framework, student assessments, and strategies for school districts.

The **Delaware** State Board of Education adopted NGSS by a 7-0 vote on September 19, 2013. Secretary of Education Mark Murphy remarked: “Our current standards do not emphasize science and engineering practices and don’t promote the type of deeper critical thinking skills students need to be successful after graduation. These new performance expectations will increase opportunities for all students.”

The State Board President, Teri Quinn Gray, is a DuPont scientist/manager. Dr. Gray opined that NGSS “provide clear and consistent, research-based standards that engage students in science instruction that will prepare them to utilize critical thinking and creative problem-solving necessary to excel in the global society.” Both the old Delaware science standards and NGSS received a “C” rating from Fordham.

On July 10, 2013, the **Washington** State Board of Education voted to recommend adoption of NGSS. The Board took their vote after hearing from a panel of science/education experts and discussing the issue for about two hours. State Superintendent Randy Dorn announced the official decision to accept NGSS on October 1. He said “NGSS will give our students the skills they need for success, whether they are college- or career-bound.” Washington’s previous science standards received a “C” rating from Fordham – the same mediocre grade given to NGSS.

On December 18, 2013, the **District of Columbia** State Board of Education voted 8-0 to adopt NGSS. Acting State Superintendent of Education Jesus Aquirre said: “With the adoption of the Next Generation Science Standards, the District is poised to take science education to a new level as we prepare our students for the increasing number of STEM careers.” The District expects to implement the standards by the 2016-2107 school year.

On January 23, 2014, the **Illinois** State Board of Education voted unanimously to adopt NGSS. Final state adoption is pending review by the Joint Committee on Administrative Rules (JCAR), a legislative oversight committee.

On September 4, 2013, the **Nevada** State Board of Education conducted a workshop on science education, and afterwards the Board voted unanimously to make NGSS an actionable item at a

future meeting. On February 26, 2014, the State Board held a public hearing on NGSS. The Board then voted to officially adopt NGSS “to reflect the value of science education and bring science education to the 21st century learner.”

On March 6, 2014, the **Oregon** State Board of Education adopted NGSS on a unanimous vote. The state went through a multi-month review process after the final version of NGSS was released in April, 2013. The Department said that since Oregon is a local control state, implementation will be led by local districts. State assessments of NGSS are projected for the 2018-2019 school year.

On July 9, 2014, the **New Jersey** State Board of Education adopted curriculum standards in seven areas: science (NGSS), English (Common Core), mathematics (Common Core), social studies, health and physical education, visual and performing arts, and world languages. State Board Pres. Mark Biedron said, “The Next Generation Science Standards will enable schools to take science to the next level and to challenge and inspire students to embrace scientific inquiry both in and out of the classroom.” New Jersey reviews education standards in a five-year cycle, and it appears that opposition to NGSS was minimal.

The **West Virginia** State Board of Education adopted new science standards on April 9, 2015 (Policy 2520.3C – Next Generation Content Standards and Objectives for Science in West Virginia Schools). The performance expectations come verbatim from NGSS, with new labels and some rearrangement of the order in which they appear. The ancillary material in the NGSS document is excluded. One change was made in an environmental standard (Grade 6 – S.6.ESS. 6): “Ask questions to clarify evidence of the factors that have caused a change in global temperatures over the past century.” The original NGSS standard uses the word “rise” instead of “change.”

In December, 2014 the West Virginia Board approved a version of the standards that included additional modifications to the teaching of climate change. This generated enough criticism that the Board decided in January, 2015 to use a version of the standards without the controversial changes. A subsequent public survey showed over 90% support for the standards, and the State Board gave its approval in April.

On May 18, 2015, the **South Dakota** State Board of Education adopted new science standards. The standards are largely based on NGSS Performance Expectations, but there are some word changes (and even a few omissions) that are designed to address concerns expressed during public review. The science standards document notes that there is “particular sensitivity to two issues: climate change and evolution,” and it suggests parents “engage their children in discussions regarding these important issues.”

Despite these changes, the South Dakota Science Standards are not significantly different from NGSS. Essentially all of the language supporting naturalistic evolution and anthropogenic

climate change remain. The changes that were made are basically cosmetic and not really significant.

The **Arkansas** State Board of Education adopted the K-8 portion of NGSS on June 11, 2015. The state adopted the performance expectations directly from NGSS, but some minor clarifications and examples were added. The Department of Education claimed that opposition to the standards' biased coverage of evolution and environmentalism was minimal. Arkansas is slated to adopt new high school science standards in 2016.

On August 6, 2015, the **Iowa** State Board of Education adopted new science standards ("Iowa Core"). The NGSS Performance Expectations were adopted verbatim as the standards, but the Framework and ancillary material in NGSS were *not* included. A minor change is that the standards in the middle school section (grades 6-8) were assigned to specific grade levels.

The Science Standards Review Team, in their report, said the "standards articulate key knowledge and skills students need to succeed.... The standards do not define advanced work in the sciences."

The **Connecticut** State Board of Education adopted NGSS on Nov. 4, 2015. Diana Wentzell, the Commissioner of Education, said: "With new science standards and a renewed focus on STEM careers, we not only set students on a path to success, we set up Connecticut for long-term economic growth." The state has set up a Five-year Implementation Plan for transitioning curriculum, instruction, and assessments.

The **Michigan** Board of Education adopted NGSS on Nov. 10, 2015, by a 7-1 vote. The Department of Education noted: "The effort to revise science standards comes from a vision for science education that is based on over thirty years of research on how students best learn science, as well as the ever-changing needs in our workplaces and communities for scientific understanding." The state is putting together a five-year Strategic Plan for implementing the standards. The Michigan standards arrange the NGSS performance expectations in a slightly different order, and most of the ancillary material in NGSS has been omitted.

The **Hawaii** State Board of Education adopted NGSS on February 17, 2016. A Department of Education press release said NGSS "brings a more engaging and enjoyable approach to learning science." State Assistant Superintendent Suzanne Mulcahy said "NGSS is aimed to excite young people about science and engineering." Hawaii is starting to implement NGSS in 2016 and aims for full integration in the 2018-2019 school year.

The **Wyoming** State Board of Education adopted new Science Content and Performance Standards on Sept. 23, 2016. Gov. Matt Mead gave his final approval on Nov. 18. Wyoming essentially adopted NGSS, but added some Wyoming examples and made a few minor changes. Specifically, three performance objectives were modified slightly to promote better objectivity

on global warming and the effects of human activity on the environment. The origins science standards are the same as NGSS.

Wyoming went through a contentious process developing the standards over a two-year period. Much of the criticism centered around NGSS' de-emphasis on fossil fuels, since Wyoming is an important fuel-producing state. Some citizens also complained about the one-sided treatment of biological origins. State Superintendent Jillian Balow said "I made a commitment to the voters of Wyoming to include all voices in the standards review, development and adoption process." The end result shows, however, that some voices were suppressed. Balow called the standards "uniquely Wyoming and nationally rigorous."

The **New Hampshire** State Board of Education adopted NGSS on Nov. 3, 2016. According to the Department of Education, this adoption "follows the lead of over 90 percent of the state's local communities that are already implementing NGSS." Tom Raffio, Chairman of the State Board, stated "the state board is pleased to have taken this important step in updating our science standards to take advantage of pedagogical and scientific advances over the past ten years."

The **New York** State Board of Regents adopted P-12 Science Learning Standards on Dec. 13, 2016. Regents Chancellor Betty A. Rosa stated "the Board and the Department took a measured, years-long approach to making sure we got it right in updating the state's science learning standards." This may be the case, but the standards ended up looking like a clone of NGSS. The format, terminology, and performance objectives are essentially a copy of NGSS. There has been some rearrangement of the order of the standards, and a small number of NGSS objectives has been removed and add a few new ones have been added. Curiously, New York added pre-Kindergarten science standards (which are not a part of NGSS).

STATE ADOPTIONS OF NON-NGSS SCIENCE STANDARDS (Alabama, Georgia, Idaho, Indiana, Louisiana, Massachusetts, Mississippi, Missouri, Montana, Oklahoma, South Carolina, Tennessee, Texas, Utah).

Several states have adopted *non*-NGSS science standards since NGSS was introduced in 2013. All of these states have used NGSS as a reference, but their standards are different (to a greater or lesser extent) than NGSS.

South Carolina Academic Standards and Performance Indicators for Science were approved in February 2014. The standards show considerable influence from NGSS, but at the same time the format and much of the content is unique to South Carolina. The standards are based on materialism. There are performance expectations related to the origin of the universe and of life; the content could be better, but at least these are not dogmatic. The coverage of biological evolution is fairly extensive. Unguided common descent is assumed to be true, but there is a

standard for critical analysis of evolution. There are several performance expectations on environmental science, and most of these are objective and neutral.

Oklahoma Academic Standards in Science were adopted in June 2014. The terminology and performance expectations are essentially a clone of NGSS. However, there are a few differences that distinguish the Oklahoma standards from NGSS. The NGSS Middle School Standards have been assigned to specific grade levels (6, 7 or 8). The High School standards include a separate section on Environmental Science, with the performance expectations copied from NGSS standards in Life Science and Earth and Space Science. Oklahoma has removed NGSS standards related to global warming, global climate models, adverse effects of human activities, and Big Bang theory. Nevertheless, the Oklahoma standards are still materialistic. They support unguided biological evolution and an activist environmental agenda.

The **Alabama** Science Course of Study (COS) was adopted in September 2015. While the thrust is materialistic, the Alabama standards are less dogmatic than those in most other states. The NGSS Framework and performance expectations are used as references, but the content standards are constructed much differently than NGSS. The standards are less focused on biological evolution than NGSS and most other state standards. The Alabama COS is generally objective and neutral in environmental science.

Utah Science and Engineering Education Standards (UT-SEEd) for grades 6-8 were adopted in December 2015. Much of the terminology and language used in the standards is based on NGSS, with some in-state modification. There is coverage of biological evolution in grade 7, which is inappropriate for that age group. The evolution standards are completely materialistic. Environmental standards are reasonable for the most part. Utah is in the process of developing new standards for the other grade levels.

Indiana Academic Science Standards were adopted in April 2016. The standards are based on NGSS to some extent, but they also reflect Indiana's 2010 standards and are different than NGSS in significant ways. The coverage of environmental science is extensive, and nearly all of the environmental standards are objective and balanced. There are several standards on evolution, and the content is entirely materialistic – stressing unguided cosmic and biological evolution.

Massachusetts Science and Technology/Engineering (STE) Standards were adopted in April 2016. The standards are clearly based on NGSS, but many of the NGSS performance objectives have been omitted, modified, or replaced. Thus while the standards have an NGSS flavor, they are still significantly different than NGSS. Like NGSS, the Massachusetts standards are completely materialistic – especially with regard to origins science. In the environmental area, activist positions are taken on anthropogenic global warming, sustainability, and negative effects of human activities on the environment.

Missouri Learning Standards in Science were adopted in April 2016. The standards are based on NGSS in many ways. However, there are also numerous differences compared to NGSS. In

some instances the Missouri writers modified the NGSS performance objectives to make them more acceptable. This is particularly true for environmental science, for which the content is generally objective and balanced. The coverage of origins science is completely materialistic – emphasizing unguided cosmic and biological evolution.

Georgia Standards of Excellence for Science were adopted in June 2016. The Framework was used as a reference, and some NGSS terminology is incorporated in the standards. The performance expectations were developed in-state and bear little resemblance to NGSS. The Georgia standards are materialistic; the biological evolution standards are based on unguided common descent. There are no standards on the origin of the universe or the origin of life. Environmental standards are generally objective.

Montana Science Content Standards were adopted in September 2016. Most of the performance objectives are taken verbatim from NGSS, although a few NGSS standards have been removed or modified. The biased coverage of environmentalism and origins science is essentially the same as that in NGSS. Curiously, neither the Framework nor NGSS are mentioned anywhere in the Montana document. The Montana standards are very compact (only 13 pages total), with a short introductory section and a list of performance objectives with no ancillary information.

Tennessee Academic Standards for Science were approved by the State Board of Education in October 2016. The document shows some influence from NGSS, but in general the standards use language developed in-state. The Tennessee standards as a whole are more detailed, more clearly written, and more comprehensive than NGSS. The standards in environmental science are objective and balanced for the most part, except for some bias in support of global warming. In origins science, however, the Tennessee Standards are materialistic and even more dogmatic than NGSS.

Idaho State Science Standards were approved by the State Board of Education in December 2016. Technically these are “temporary” standards, awaiting final legislative approval in 2018. The standards are based primarily on NGSS. Most of the performance objectives are taken verbatim from NGSS, but a few have been modified, eliminated, or replaced. In particular, some of the more objectionable environmental standards were removed. The materialistic standards on cosmological and biological evolution are taken almost intact from NGSS. Like NGSS, the Idaho standards begin coverage of biological evolution in middle school, which is age-inappropriate.

Louisiana Student Standards in Science were adopted in March 2017. Most of the performance expectations are taken verbatim from NGSS, and NGSS terminology is used throughout. There is some rearrangement and minor modification of NGSS standards. A high school course on Environmental Science has been added, with some of the standards borrowed from NGSS Earth and Space Science. Some of the environmental standards are objective, while others show an activist bias. The origin science coverage is materialistic – essentially identical to NGSS.

Mississippi College- and Career-Readiness Standards for Science were approved by the State Board of Education in April 2017. The standards are based on NGSS, the 2010 Mississippi standards, and newer standards from some other states. While some terminology is borrowed from NGSS, the performance objectives were for the most part developed in-state. There are numerous environmental standards, and most of them are objective and neutral – particularly in the areas of climate change and sustainability. There is perhaps a little too much emphasis on negative human impacts on the environment. The coverage of biology is very extensive (perhaps more than any other state), and the performance objectives are totally materialistic with regard to the origin and development of life. There are course descriptions for *ten* biology-related courses in high school, and all of them contain material on unguided evolution.

The **Texas** Essential Knowledge and Skills (TEKS) in Science date back to 2010 (before NGSS). The state is currently in the process of “streamlining” certain standards to reduce the amount of material that is covered. Streamlined High School Biology standards were approved by the State Board of Education in April 2017. The original biology standards provided opportunities for critical analysis of biological evolution, and the revamped standards maintain most of that language. Materialistic standards on the origin of the universe, of life, and life’s diversity have been retained. Overall, however, the Texas origins standards are less dogmatic as compared to NGSS. The Texas standards in environmental science are quite good.