| | States with Excellent Standards<br>District of Columbia \| Massachusetts \| South Carolina | | | NGSS | Kentucky |
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| Fordham Grade | A- | A- | A- | C | D |
| Overview | The D.C. science standards are generally clear and rigorous, with content that progresses appropriately through the grades. Virtually all of the essential K-12 science content is covered effectively and succinctly, proving that standards don't have to sacrifice coverage and depth when pursuing concision. | The Massachusetts science standards are easy to read and to use. Across disciplines, their quality and depth is strong. Particularly at the high school level, the standards are clear and comprehensive. There are a few minor content omissions, but no major gaps or errors. | South Carolina's science standards are rigorous, clear and succinct, and they outline the essential K-12 content that students need to learn. Content coverage is generally thorough, and concepts develop in logical progression over the advancing grades. | The NGSS fall short of excellence in several ways, including: overemphasis on practices over essential content; omission of much essential content; failure to integrate mathematics content that is essential to science learning; and use of "assessment boundaries" that put arbitrary ceilings on the content that will be assessed (and therefore taught) at each grade. | The Kentucky science standards are lamentable less for their flaws—though there are plenty—than for their failed potential. A scaffold exists for what might have been an effective set of standards. But the documents are so short on details—including critical content—that the standards fail to provide the backbone for a rigorous K–12 science curriculum. |
| Scientific Inquiry and Practices | The scientific inquiry and methodology standards are presented as a separate strand that, while not explicitly tied to content, is generally clear and appropriately rigorous. | Process standards are straightforward and well integrated with content. Mathematical problem-solving is stressed along with investigation and experimentation. Also emphasized is the need for students to communicate effectively about their work in science, both orally and in writing. | The inquiry standards are clear and thorough. South Carolina presents inquiry standards and practices two ways. First, there is a separate "inquiry" strand included for every grade level. Additionally, each performance expectation (i.e. standard) includes multiple "indicators" that clarify both the content that students need as well as what they're meant to do with it—i.e., the "practices." Critical process standards are directly integrated with content, making the link between the two unambiguous. This integration helps to ensure that skills are taught within the context of the knowledge that students need in order to master them. | Good science consists of doing as well as knowing, of practices as well as content and concept. But integrating practices and content in K-12 standards requires a careful balance that NGSS fails to strike. Instead, they confer primacy on practices and pay too little attention to the knowledge base that makes those practices feasible and worthwhile. Indeed, the authors have integrated a scientific "practice" into every performance expectation, too often in ways that are forced, ill-conceived, and/or detract from the essential content that students need in order to think critically and engage in scientific inquiry. | The science-process standards are scattered across various "big ideas," making it difficult to track what, specifically, students should master at each grade level. Several important topics are vaguely introduced, then not revisited for several grades, if at all. |

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| **Physical Science (Including Physics and Chemistry)** | The physical science standards are clear, appropriate, and thorough. Content systematically builds from grade to grade. Students can acquire a thorough background, preparing them well for high-school-level courses. In addition, the high school physics and chemistry coverage is excellent. The one drawback is occasional inclusion of "examples" that are meant to clarify standards but are often silly. | Although generally solid, the physical science standards for pre-Kindergarten through eighth grade suffer from omission or short-changing of several important topics. The high school physics standards, however, are systematic, logical, and pedagogically sound, and high school chemistry is handled with refreshing depth and specificity | Virtually all of the essential physical science, physics and chemistry content is included and clearly progresses from grade to grade. At the high school level, however, while essential content is included, the expectations would occasionally benefit from greater specificity. | NGSS physical science coverage is mediocre throughout grades K–5 and declines rapidly in middle school, and still further at the high school level. Overall, the physical science standards fail to lay the foundation for advanced study in high school and beyond, and there is so little advanced content that it would be impossible to derive a high school physics or chemistry course from the content included in the NGSS. | The K–8 physical-science standards are missing much essential content. What little content exists is poorly developed and does not progress well through the grades. At the secondary level, there is nothing in the entire document that could provide the foundation for a course in high school physics or chemistry. |
| **Life Science** | The life science standards are thorough, well developed, and appropriately rigorous. They could easily serve as a model for other states. | Virtually all critical life science content is included and well developed in the MA standards. The coverage of evolution in grades six through eight, in particular, is both appropriate and good. High school biology content is also clear, concise, and comprehensive. | While coverage of evolution at the middle school level is occasionally evasive, the grades K-8 life science standards are otherwise reasonably strong. The standards for high school biology are excellent, and the treatment of evolution at this level is excellent. | Life science is generally solid in elementary school, but grows thin by middle and high school. Too much important content is represented only by mention or allusion within "omnibus" standards that refer to large bodies of content for which either necessary precedent in lower grades or needed detail is missing. | The earlier grades provide poor preparation for high school work, but there is some good material at the high school level. Some of the vagueness that permeates the lower grades does, however, persist. And the standards seem allergic to the word "evolution." |
| **Earth and Space Science** | Coverage of earth and space sciences is excellent across all grade levels. Occasionally, however, the presentation of the content is marred by examples that don't match the rigor of the material. | Earth and space science is covered comprehensively, and only occasional omissions mar these otherwise strong standards. | With the exception of a few minor errors and overly broad standards, the South Carolina earth and space science standards and related support materials present most of the essential K-12 earth and space science content. | The NGSS earth and space science standards are ambitious in their scope. Unfortunately, too many standards become long laundry lists of topics, even as essential prerequisite knowledge that needs to be mastered is assumed but never specifically required or mentioned. | The standards for earth and space science are severely flawed. Important content is entirely missing (e.g., plate tectonics). There are but occasional glimmers of substantive content (such as coverage of the age of the earth and solar system in eighth grade). |

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| Clarity and Specificity | The D.C. science standards are clear, succinct, and specific. The one minor drawback is the inclusion of "examples" (instructional activities that can help students master particular concepts) that are sometimes weak and occasionally absurd, particularly in high school. | The Massachusetts standards are clearly presented and easy to navigate. Occasionally, additional detail would help clarify what is actually expected of students. | The South Carolina standards are presented clearly and are nicely linked to support documents, which add significant value by providing specific details and clarifying what, precisely, students should know and be able to do. | The presentation of the NGSS is cumbersome and difficult to navigate. In addition, too many individual performance expectations are vague and poorly worded, with broad references to concepts that lack specific guidance about what, precisely, students should know and be able to do. | Lack of specificity and general ambiguity are a persistent problem for the Kentucky standards. Long passages of vague statements are sometimes punctuated by excessively detailed bits that students cannot possibly address. And too many ideas are alluded to, glanced at, approached obliquely, or mentioned vaguely. |