

Science Standards Recommendation Committee

Position Statement

The Science Standards Recommendation Committee convened five times between March 2016 and July 2016 as part of a comprehensive, transparent, and Tennessee-specific standards review process. The Committee reviewed the initial feedback collected on the public review website in fall 2015. They also studied in-depth the draft standards developed by the educator advisory teams. As part of its review of the revised standards, the Committee solicited and reviewed multiple types of feedback. Data and comments collected from the public website on standards were reviewed, along with feedback gathered through a series of regional roundtable conversations. Additional feedback from a team of Tennessee higher education faculty and the Southern Regional Education Board (SREB) was considered, as well as, input from business, industry, and professional organizations.

Following the review of the revised standards and various feedback provided, the Committee developed a series of recommendations for revision and sent those back to the educator advisory teams to review and incorporate into the standards. The resulting document is the set of science standards proposed to the State Board of Education for first reading at their July 22, 2016 meeting.

The Committee believes these new, proposed standards represent a significant step forward for science education in Tennessee. The new standards signify several large shifts for students and teachers, focusing on application and exploration of scientific concepts rather than memorization of facts. This innovative approach is intended to encourage creativity while also increasing the students' exposure to postsecondary and workforce application skills through engineering, technology, and science practice standards.

Throughout the development of their recommendations for revision, the Committee discussed several other topics related to the successful implementation of the new science standards. The following items represent the Committee's positions on standards implementation:

1. **Empowering Educators** - The Standards Recommendation Committee acknowledges that the key obligation of standards is to articulate the expectations for what students should be able to know and do at the end of each grade level and/or course. The Committee was particularly conscientious that standards should focus on expectations for student learning and should not prescribe how the content should be taught or particular resources for teaching. The purpose of the standards is to provide clear expectations for student learning, and they are not intended to encompass the type of specificity and resources that a strong curriculum is expected to provide.

The Committee values the professional expertise that Tennessee teachers bring to their classrooms each day and believes that the Tennessee Academic Standards for Science allow them flexibility and discretion to determine the best teaching methods and resources to facilitate their students' learning.

- 2. Professional Development** - The Standards Recommendation Committee recognizes the importance of comprehensive and robust teacher and leader professional development as part of the successful implementation of the Tennessee Academic Standards for Science. The focus of this professional development should be to provide ongoing support for educators that extends beyond the summer prior to implementation and supports them throughout implementation of these proposed, new standards. As soon as the standards are adopted, school districts are encouraged to begin professional development.

As such, the Committee recommends the development of an extensive professional development strategy by the Tennessee Department of Education (TDOE) in partnership with other stakeholders, such as districts, Tennessee higher education entities, and science education professional organizations. This strategy should focus on both comprehensive training for all teachers as well as providing additional support in a few key areas. The Committee recommends districts utilize currently practicing teachers and leaders to deliver this professional development in a train-the-trainer model. This approach builds the capacity of leading educators in districts to redeliver high-quality training to their peers. Train-the-trainer models also ensure a focus on training consistency and quality.

The Committee urges the TDOE to ensure that training is grounded in the *Framework for K-12 Science Education* (<http://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts>). Additionally, state- and district-provided training should make use of high-quality online resources. For example, the Tennessee Science Teachers Association (TSTA) provides video resources like *Inside the Teachers Studio* (<http://www.tsta.wildapricot.org/page-1696732>), and the Ayers Institute-sponsored Tennessee Curriculum Center provides grade and standard level resources.

The Committee believes that additional support will be particularly important for elementary teachers during this standards transition. The new standards necessitate that teachers possess a robust understanding of science content. Many elementary teachers will need focused professional development to ensure their conceptual understanding of the content is strong. Furthermore, elementary educators will need school and district leadership's support to make the needed space and time during the school day to teach science. The standards feature new content in each of the early grade levels, representing a shift from the previous standards in which several standards were repeated throughout the early grades. This further emphasizes the need to ensure there is high-quality instruction taking place in each of the early grades, so that students have mastered the needed content and skills to be successful in upper elementary and middle school science.

- 3. Supplemental Resources** - The Standards Recommendation Committee acknowledges the importance of high-quality resources as part of the successful implementation of the Tennessee Academic Standards for Science. As such, the Committee recommends that several types of dynamic resources be created prior to implementation in 2018-2019 that will aid educators in better understanding the Tennessee Academic Standards for Science.

The Committee advises that a supplemental document, written by the educator advisory team to provide additional clarification and examples to help educators unpack the meaning of the standards, be completed the year prior to implementation. The supplemental document should include descriptions of the crosscutting concepts and vocabulary specific to the *Framework for K-12 Science Education*, such as investigating, models, modeling, research, data, argumentation, scientific world, scientific findings, criteria for constraints, evolution, and integration of evidence. The Committee also emphasizes that this supplemental document and any others created are not curricular resources nor intended to be used as a checklist for standards. They are to be developed and used as support resources and are not intended to be representative of everything needed for student mastery of a standard.

The Committee also urges the TDOE to consider the creation of a dynamic website for standards-related content. The intent of this website would be to create a common place to house information about both the standards and corresponding supplemental resources. Specific information geared toward parents would be a valuable addition to such a website. The Committee urges the TDOE to consider exemplary websites from other states, including Florida's standards website (<http://www.cpalms.org/Public/>).

Finally, the Committee believes it is important to ensure that schools have adequate infrastructure and equipment to effectively implement the standards. While the new standards do not prescribe the use of particular equipment, high-quality and rigorous science instruction includes student access to science labs as well as other scientific tools and equipment, so that students can experience science in action. The Committee recommends that schools and districts consider partnering with universities, business and industry groups, the Tennessee STEM Innovation Network (TSIN) Hubs (www.tsin.org), and other organizations to provide access to key equipment and resources. Many of these partners already support these efforts through provision of traveling science labs, lending libraries, STEM mobiles, and programs such as *Biology in a Box*.

4. **Assessment** – The Standards Recommendation Committee advises the critical importance of teaching all standards for a grade and course. Even if a particular grade or course is not given a standardized assessment, all educators share the responsibility of preparing students for future assessments and the progression of learning across multiple grades and courses. Additionally, the Committee recommends that educators focus on helping to prepare students for success on college and career readiness exams, such as the ACT, SAT, and Armed Services Vocational Aptitude Battery (ASVAB). The Committee recommends the assessment process be transparent. For example, sample test items should be available for public review, educators should have the opportunity to provide feedback to TDOE, and student reports should be clear and readily accessible in a timely manner. The Committee urges the State Board of Education to consider whether additional flexibilities in the accountability system might be needed during the standards transition. Finally, the Committee recommends that the first year of new assessments aligned to the new standards be used to inform improvements and not impact teacher performance evaluations or student grades.

Science Standards Recommendation Committee Members

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