



Karen Molchanow
Executive Director
State Board of Education
333 Market Street, 1st Floor,
Harrisburg, PA 17126.

July 2, 2021

Dear Ms. Molchanow,

I am contacting you with my comments about The PA Department of Education plans to revise the Pennsylvania standards for Science, and Technology, and Environment and Ecology. The old 2002 standards definitely needed updating.

The new standards apparently concentrate on big ideas, concepts, systems, and connections within and between disciplines of science (<https://www.education.pa.gov/Teachers%20-%20Administrators/Curriculum/Science/Pages/Science-Standards.aspx>)

I am glad to see that the standards include the “Crosscutting Concepts” recommended by the National Science Teaching Association. This kind of thinking could help develop the “STEM-literate citizens” mentioned in [Appendix B-1 \(Science Standards\)](#).

However, a full understanding of big ideas and systems also requires in knowledge of essential information and examples. I am concerned that the proposed new 2021 standards do not appear to include the nine detailed areas within Environment, Ecology and Agriculture that were present in the 2002 standards. It is not possible to determine what specific content will actually be taught in the description of the proposed new standards for Environment and ecology, and science and technology, available online.

For example, watersheds are mentioned on p.3 but there is no mention of the essential details that were in the 2002 standards: Cycles, Role of Watersheds, Physical Factors, Characteristics and Functions of Wetlands, Impacts of Watersheds and Wetlands. Students need to know these details because their cycles, roles and functions are integrally connected to water supplies essential for human consumption, and for agricultural crops. More frequent droughts and floods have been occurring over recent years and are likely to get worse. As future educated citizens they will need to understand the importance of protecting wetlands and watersheds in order to prevent pollution and overuse and provide clean drinking water for people and for wildlife.

Other details are omitted. The word “diversity” is mentioned three times in standards for grades 6-12, but never in reference to species diversity. Endangered species are mentioned only once, early in the document (p.3), but the specifics from the 2002 standards are missing: “Threatened, Endangered, and Extinct Species – Management Strategies.” Students need to learn how environmental health, biological diversity, and ecosystems are important for human physical and mental health and should be kept in good condition for nature and for people.

Many people don’t know where their food comes from, and how it is produced. Will the new standards give students an understanding of agricultural science and systems, how agriculture affects water quality, how agriculture and climate interact, and the use of integrated pest

management? These topics are briefly mentioned on page 3, but where are the details? They are not mentioned in the standards.

The purpose of developing “STEM-literate citizens” should not only be to enable students to find a job after graduation. Current and future students need deeper knowledge in order to become fully informed citizens, prepared to respond to changes in technology and environmental conditions and the associated challenges and opportunities they will face.

The new standards are a big improvement, but I think they would be much better if the nine detailed areas that were listed for Environment, Ecology and Agriculture in the 2002 standards were added to the new standards and included as performance expectations that teachers will be required to cover. Please consider my comments and thank you for supporting quality education for students in Pennsylvania.

Sincerely,

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