

Revolutionizing STEM Learning in Pennsylvania



The adoption of the 2022 Pennsylvania Science, Technology, Engineering, Environmental Literacy and Sustainability (STEELS) academic standards is a once-in-a-generation opportunity to maximize the impact of STEM innovation, workforce development, economic development, and educational excellence in Pennsylvania. **Pennsylvania Statewide STEM Ecosystem (PSSE) calls on the incoming Shapiro-Davis administration to provide the resources and support to implement and assess these standards with fidelity.**

PSSE

PSSE is a statewide, cross-sector network of over 900 stakeholders, administered by a 14-member Leadership Team representing Pennsylvania's diverse regions and perspectives. Pennsylvania's individual STEM Ecosystems, and PSSE as a whole, are based on Stanford's Collective Impact Model and allow members in business, education, and community organizations to work together to strengthen STEM resources and accelerate outcomes within a region. PSSE has been influential in informing bipartisan legislation, spotlighting innovative practices, connecting youth to STEM secondary, post-secondary and career opportunities, and providing professional development for STEM educators. Our vision is for all Pennsylvanians to have access to quality STEM education and career pathways to become tomorrow's leaders, influencers, and problem-solvers.



The STEELS Standards

The recently adopted 2022 STEELS Standards replace the 2002 standards, which promoted subject-siloed, teacher-centered learning^{1,2,3} paired with convergent standardized tests. The STEELS Standards were created through a responsive, intentional process,⁴ which resulted in standards that support new ways of teaching and learning. STEM educators in Pennsylvania support these standards and are eager to make changes to classroom instruction and assessment to promote interdisciplinary, student-centered learning.

NOTE

This is the first in a series of policy memos that PSSE will release over the next two years. Policy priorities were decided by PSSE membership through surveys and meetings in the fall 2022 and the final document was vetted by members before release. It is intended for policymakers and the general public as a short summary in a single policy area.

Full implementation of the STEELS Standards will revolutionize the way our students are taught

Research on how students learn has expanded and improved over the past twenty years. We now know that students learn best through projects focused on explaining phenomena and solving problems that are meaningful to them.^{5,6} The new STEELS Standards support this hands-on, integrated, interdisciplinary approach, which mirrors the work of STEM professionals.

We call on the Shapiro-Davis administration to support local education agencies as they prepare teachers and administrators to make the pedagogical shifts required of [3 Dimensional Learning](#), redefine teacher evaluation to mirror performance expectations in the standards, and update curriculum to be inclusive of 3 Dimensional Learning.

This support from the Shapiro-Davis administration should include:

- Funding for higher education institutions to reimagine educator and administrator preparation programs.
- Innovation grants for local education agencies and STEM ecosystems to improve and update teacher development and mentorship programs.
- Encouragement for Pennsylvania Departments of Education and Labor and Industry to work collaboratively to expand apprenticeship and pre-apprenticeship programs and align them to the STEELS Standards.
- Innovation funds that incentivize collaboration between school districts and STEM Ecosystems in the implementation of the STEELS Standards.

REFERENCES

- [1 PDE Research Report: STEM](#)
- [2 PDE Research Report: Math](#)
- [3 PDE Research Report: Career and Technical Education](#)
- [4 PA PDE Stakeholders Report](#)
- [5 Project Based Learning Meta Analysis](#)
- [6 Taking Science to School](#)

Full implementation of the STEELS Standards will require changes to the ways in which students are assessed

Pennsylvania's 2002 standards were assessed using standardized tests based on the premise that each question has one correct answer. The new STEELS standards are multidisciplinary and expect students to learn divergent thinking skills by applying STEM content and practices through novel projects. Assessment should use a variety of methods to best show how students are meeting all three dimensions of the performance expectations. STEELS Standards are an opportunity for Pennsylvania to continue to make systemic change in assessment that enable all students to demonstrate their learning.

PSSE calls on the Shapiro-Davis administration to commit the resources and guidance required to fully implement and assess the new STEELS academic standards

In the words of Dr. Lee Williams, State Board of Education, "The Board recognized that updating our science standards was essential to help create the conditions for all students to be scientifically, technologically, environmentally, and engineering literate, both to support Pennsylvania's economic vitality and its civic strength." This is a moment where our state can truly innovate and provide leadership throughout our STEM ecosystems. Let's move forward together!



FOR MORE INFORMATION

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[Pennsylvania Statewide STEM Ecosystem](#)

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