



Pennsylvania Council of Professional Geologists  
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FROM: PENNSYLVANIA COUNCIL OF PROFESSIONAL GEOLOGISTS  
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RE: Public Comment on Proposed Amendments to 22 Pa. Code Chapter 4

The Pennsylvania Council of Professional Geologists (PCPG) is a non-profit corporation founded in 1989 to support licensed Professional Geologists and allied scientists in Pennsylvania through advocacy, networking and education. One of our core responsibilities as an organization is to provide:

*“Outreach to academia to support and encourage geologic science curricula in our public schools and at Pennsylvania's public and private colleges and universities.”*

PCPG recently completed a strategic planning initiative that found a well-integrated and applied STEM curriculum throughout K-12 education and undergraduate college study is needed to support emerging earth and environmental science related fields.

PCPG applauds the integrated approach to science education and the incorporation of outside sources to enhance education. The Pennsylvania Vision Statement reading: *“Success depends upon partnerships between educators, students, families, postsecondary institutions and providers, legislators, business and industry,”* is essential to science education and development.

The following comments focus on this vision statement and provide commentary on areas where PCPG feels this is not met within the new standards:

1. The statement above does not address many of the non-profit entities that provide services to educational institutions. In fact, many, such as PCPG, can provide free educational opportunities to support educational growth and work directly with many public and private institutions to provide “real world” scenarios and professionals.
2. The standard lists eight “Crosscutting Concepts” to bridge disciplinary boundaries in the core sciences. PCPG believes a ninth “Crosscutting Concept” should be “Applied Science.” Applied Science would be applied, multidisciplinary, real world project that can be used to show how core sciences work together and are applied within the community.
3. **Decision-Making and Action Skills** Performance Expectations include what students should know and be able to do. Performance Expectations integrate Science and Engineering Practice, Disciplinary Core Ideas and Crosscutting Concepts for assessment. Furthermore, integration resources are provided in the standard that include *“Community-based organizations that provide out-of-school time for STEM and environmental education.”* These organizations can be essential for understanding “real-world” projects and conditions that can enhance understanding on how communities and professionals work together to address problems and the actions

required for teamwork and outreach and communication critical to project development. It is our opinion that the new standards do not go far enough to require school districts to use these resources. In our experience, during discussion with K-12 teachers, many do not respond to offerings, don't have the time in their curriculum, or do not have programs or lessons plans created that integrate outside sources. Unless the standard does not suggest, **but requires**, use of community-based institutions, then the expectations will fall short of their goal.

4. **Personal and Civic Responsibility** The standards discuss the "Literacy" of the students. "Literacy" as defined in the standard, *"requires more than possessing knowledge; literacy requires being able to **apply** knowledge."* In the opinion of PCPG, understanding the roles and importance in the community of Professional disciplines (Geology, Engineering, etc.) is essential to "Literacy." Professionals have disciplinary knowledge and ethical requirements for licensure that can and should be part of any literacy program for the sciences. Furthermore, having professionals explain how they apply their professions to projects in the community is critical for student development and understanding of the profession, but not specifically required under the standard. PCPG recommends incorporation of a standard or metric that can be used to track and monitor progress in the use of outside organizations. This could be a credit-hour commitment, project-oriented activity, job shadow, field trip, webinar or other means to involve a professional organization in student development. The standard just does not require this, and if not, will not be utilized.
5. The standards **significantly reduce if not omit Environment, Ecology and Agriculture** from the secondary level. Geology is critical to the understanding of the Environment, Ecology and Agriculture and if limited will reduce the understanding of how Earth Science integrates with these disciplines and limits students' knowledge on how these important subjects work in the community. PCPG recommends specific requirements be added to these standards in the curriculum.

Environmental professions are expected to grow by 8% according to the U.S. Bureau of Labor Statistics over the next decade. Geological knowledge is a critical component of this market sector and Geologists must be licensed in Pennsylvania and 31 other states to tackle environmental issues. PCPG believes specific standards need to be required not merely suggested in the curriculum or they will not be taught. The requirement to use professionals to explain how they apply their knowledge gives students the practical experience and inspiration to apply science, ecology, geology and environmental concepts to solve the real-world issues in their communities.

PCPG appreciates the opportunity to provide our input on the educational standards and looks forward to working with the K-12 educational community in the future. Please do not hesitate to call with any comments or questions.

SINCERELY,



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