



July 5, 2021

Karen Molchanow  
Executive Director  
State Board of Education  
333 Market Street, 1<sup>st</sup> floor  
Harrisburg, PA 17126  
[Ra-stateboardofed@pa.gov](mailto:Ra-stateboardofed@pa.gov)

**SUBJ: DCNR Comments on Science Standards**

Dear Mrs. Molchanow:

On behalf of the Pennsylvania Department of Conservation & Natural Resources (DCNR), I want to thank you for this opportunity to share our agency's input on the proposed science standards and underscore the importance that environmental literacy plays in our work and workforce development.

Pennsylvania has long been a leader in promoting a strong environmental education curriculum and we are supportive of modernizing and strengthening these practices. Pennsylvania's Environmental Education Act affirms that environmental education is an essential component to basic education, encouraging the Commonwealth to adopt high-quality environmental and ecology standards throughout grades K through 12. To support these important goals, DCNR, along with the Departments of Agriculture and Environmental Protection, have financially supported the Environmental Education Advisor position, housed within your agency, to ensure environmental, agricultural and STEM educational priorities are upheld through our state's core standards and to increase the public's literacy in each of these three content areas.

DCNR is vested in the outcomes of this process and environmental education is heavily embedded within our strategic initiatives and mission. In fact, the Department was instrumental in establishing the existing Environmental Science and Ecology stand-alone standards adopted in 2002, leading Pennsylvania to become a national leader on environmental education.

As you know, educational and workforce pipelines are reinforced through strong environmental connections and learning in the classroom. The necessary exposure to environmental science and ecology in primary and secondary classrooms leads to post-secondary and technical degrees that support many important sectors within Pennsylvania, including forestry, conservation science, agriculture, clean energy, hydrology, geology, climate science, engineering, park and recreation management, biology, sociology, political science, wildlife management, ecology, and more.

The integration of environment, ecology, and agriculture core areas are essential to preparing students for a global 21<sup>st</sup> century economy; but these essential disciplines will more importantly empower these younger generations, through their post-secondary education and careers, to

attain proactive roles in addressing some of our society's most challenging issues, including climate resiliency, food security, sustainability, and environmental and climate justice.

Please consider the following recommendations as you work to finalize and implement the science standards:

- Incorporate strong environment and ecology standards to reinforce the everyday connections between humans and our natural world. Ensure that the standards incorporate these essential principles of environmental education:
  - *Systems Thinking* recognizes the complexity of our natural world and reinforces the interconnectivity between nature and our physical, chemical, and biological processes.
  - *Human Health* reinforces the inextricable connection between a healthy earth and the sustainability of people-made systems, including social, economic, political, cultural and technology.
  - *Diversity, Equity, and Inclusion* underscores the need for an inclusive, respectful and equitable approach to environmental education that embraces different cultural backgrounds and experiences.
  - *Direct Experience* ensures that students have direct connections with nature. These experiences, which foster critical cognitive skills and an appreciation of natural systems, are particularly meaningful when they relate to their communities and surroundings.
  - *Expanding* environmental science and ecology principles across disciplines enriches cross-curricular connections and reinforces the strong links between environmental education and the sciences and humanities.
  - *Critical and Creative Thinking* are imperative for active and meaningful learning, instilling lifelong skills that rely on observation, analysis, inference, and communication.
  - *Sustainability* reinforces the interrelationship between the needs of society and the natural resources and services that support society. It is essential that students understand environmental, social, and economic responsibility and the role each of us plays in shaping the future of our planet.
- Underscore civic responsibilities and empower teachers to create a mindful and engaged citizenry through the education of upcoming generations.
- Ensure that teachers are empowered to educate students on the role they play as stewards and how human activity impacts the environment.
- Reinforce, through standards, values of stewardship, sustainability, equity, and environmental justice.
  - The current standards quote the text of Article 1, Section 27 of the Pennsylvania Constitution and we strongly encourage that the revised standards do the same and reassert the following:
    - *[t]o this end it is our responsibility to develop a citizenry that is aware of and concerned about the total environment and has the knowledge and*

*skills to work toward solutions to current problems and the prevention of new ones.*

- Incorporate standards around the subject of climate science that goes beyond teaching science but also embeds cultural and civic aspects into the learning to effectively reinforce comprehension, critical thinking, and analytical skills.
- Encourage students to embrace the world, beyond themselves, and to contemplate their roles and responsibilities in defining the future of their community, their nation, and their planet.
- Continue to integrate Meaningful Watershed Educational Experiences (MWEEs) that reinforce the importance and interconnection between our water cycles and systems (e.g., watersheds, wetlands, etc.) and offer hands-on, learner-centered experiences for students (e.g., engage students in environmental restoration and protection projects and civic and community efforts).
- Reinforce the importance of biological diversity and the complex relationships among species, natural resources and the environment, humans and human health, and the integrity of our ecosystems.
- Similarly, strengthen students' understanding of human connections with the natural world, the importance of biodiversity, the protection of threatened and endangered species, and the impacts of human activity on the environment and wildlife.
- Reinforce the role of agriculture in our society and empower students to make connections to our food systems, natural resources and ecosystems, domestic and global economies, science, history, and public health.
- Emphasize the need for and role of environmental laws and regulations and their impacts on the health and well-being of the environment and communities.
- Address the issue of sustainability in regards to natural resource protection and the use of finite and renewable resources.
- Ensure equitable access to the outdoors and meaningful environmental education experiences for BIPOC youth and those living in environmental justice and underserved communities.
- Create meaningful, direct outdoor experiences for special needs learners that stimulate various senses, taking into account differing senses and physicality. Outdoor experiences should offer exploratory learning through visual, auditory, and tactile stimuli.
- Center environmental education and outdoor learning through students' lived experiences that reinforce meaningful connections with nature, people, and community and instill a lifelong sense of stewardship and establish an active and informed citizenry.
- Advance human rights, social and environmental justice, and economic equality and purposefully examine the cumulative impacts of climate change, ecological degradation, air and water pollution, and other environmental injustices on people, particularly on BIPOC and underserved communities.
- Ensure the science standards encourage the use of inclusive language and address cultural sensitivities and systemic oppression and racism. For example, it is important to

acknowledge ancestral lands and the people and cultures that thrived long before Europeans colonized America.

Finally, I would like to highlight the significant investments made by DCNR in advancing environmental literacy through the work of our environmental educators; environmental programming at state parks, forests, and environmental education centers; and our partnerships and collaborative efforts with key stakeholders. DCNR takes this role very seriously and all of our school programs and activities are standards-based and serve to supplement classroom instruction. This work includes the following:

- 118 environmental educators are employed in the Bureau of State Parks, offering 21,250+ program hours, including environmental education, interpretation, and recreation programs, each year to teachers, students, and park visitors.
- Bureau of Forestry employs three environmental educators in addition to county-based service foresters who also provide educational programming.
- The development and implementation of 4,300 environmental education programs, addressing content standards across the board, to over 142,000 school students each year.
- 125 annual teacher trainings delivered to over 2,000 educators in curricula such as Project WILD, Project Learning Tree, PA Land Choices, Watershed Education, PA Songbirds, Climate Literacy, Project WET. Day-long, multiple day and week-long workshops are offered to help educators with instruction hours needed for certification, and to address standards within content areas.
- The Bureau of State Parks has "provider status" granted by the Department of Education for 10 highly-recognized environmental education curricula. Included are: Project WET, Project Learning Tree, Project WILD, Growing UP Wild, Wonders of Wetlands, and Healthy Water, Healthy People. This elevated designation allows qualified bureau staff to provide Act 48 (Professional Development) credits to Pennsylvania educators who participate in these workshops.
- DCNR is Pennsylvania's official sponsor of the international program, Project Learning Tree. The Bureau of Forestry has been involved in PLT since the early 70's, and currently leads this program by providing training, materials, and support to educators across the commonwealth.
- DCNR is Pennsylvania's official sponsor of the national program, Project WILD. The Bureau of State Parks recently assumed this role in coordinating the wildlife education program for educators in Pennsylvania.
- 300 climate change and sustainability focused programs are offered that utilize inquiry techniques to help students learn how to think, question, and plan research projects not what to think.

We look forward to continuing our partnerships with Department of Environmental Protection, Department of Agriculture, and Department of Education so that Pennsylvania remains a leader in advancing environmental literacy.

Thank you for this opportunity to offer our input and guide the advancement of Pennsylvania's science education for the coming decades.

Sincerely,

A handwritten signature in black ink that reads "Cindy Adams Dunn". The signature is written in a cursive style with a large initial "C".

Cindy Adams Dunn

Secretary

CC:

Karen Farmer White, Chairperson of the State Board of Education

Noe Ortega, Acting Secretary, Department of Education

Dr. David Volkman, Special Assistant to Acting Secretary of Education