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To: IRRC
Subject: Public Comment on behalf of the Penn State Science Policy Society ID # 347

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Agency: State Board of Education
 Identification number: 347
 Regulation: #6-347: Academic Standards and Assessment

Dear Executive Director Karen Molchanow and decision makers,

The Penn State Science Policy Society is a coalition of graduate degree students interested in playing an active role in the interaction between science and public policy. Given the vast breadth of complex and often technical issues policymakers must address, we believe that external scientists can play a useful role in informing the decision process, especially in matters relating to STEM education. We submit the following comment on the recently proposed regulation on academic standards and assessment in the state of Pennsylvania.

Summary: We express our support for the regulation, and fully endorse the objectives of the proposed amendments to the existing academic standards and assessment. While we believe that the comprehensive plan outlined in the regulation will be impactful in achieving these objectives, we have comments specific to two of the priorities highlighted in various sections of the document – equity in education, and the relationship between humans and the environment. We call for (i) more specificity in the budgeting, taking into consideration the discrepancy in school funding between wealthy and poor school districts, and in this context, (ii) the use of data-driven metrics to evaluate the effectiveness of the implementation of the proposed regulation. We also call for (iii) an explicit description of the role of human activity in causing modern climate change.

Promoting Equity

We appreciate the consideration of equity in the proposed regulation; however, we find the statement to be vague. We believe that efforts should be made to account for the disproportionate economic impact of implementing changes in the proposed curriculum on communities of varying incomes. It is unclear in the section about state government costs if these differences in needs were considered. The percentage of school funding the state of Pennsylvania provides is among the lowest in the nation, relying on a large portion of school funding to come from local sources (1). Despite Governor Wolf's attempts to funnel all state education funding through the fair funding formula (2), only about 15% of state funding will be sent through this formula in the upcoming year's state budget (3). This formula is meant to distribute money to schools more fairly based on need, and the relative absence of this formula in the upcoming budget results in disproportionate school funding between wealthy and poor districts (4). **Additional costs due to the implementation of new standards may further intensify differences and place additional strain on low-income school districts.**

In addition, residual damage from decades of inequitable funding distribution may necessitate additional support and resources in low-income districts to achieve the goals of the new education standards. We would like the PA State Board of Education to take these considerations into account when determining the budgeting implementation of the proposed regulation.

We recognize that extending the review cycle for the standards from every 3 years to every 5-10 years provides a better framework to strategically update and implement these academic standards. We appreciate the dedication to research-informed practices to improve the content of the standards. **However, we additionally advocate for the use of data-driven metrics to evaluate the effectiveness and equity of the implementation.** Moving forward, using data from the state assessment system could provide insight into which districts or schools face unforeseen hurdles while integrating the

updated standards into curriculum. However, the current scope of assessment for grades 9-12 insufficiently captures the range of scientific concepts included in the updated standards. Additionally, data beyond standardized testing may be necessary to determine what specific challenges face educators across the state. These insights could warrant updating the standards to reflect the feasibility of implementation or motivate additional budgetary support to address challenges (5). Addressing the specific barriers to implementation is essential for constructing “a foundation of knowledge and skills critical for and accessible to all students,” as equity is defined in the proposed rule. We would like to see a more detailed plan to monitor and evaluate the implementation of the standards across Pennsylvania.

Addition to Climate Change Standard

While we find the updated curriculum exemplary, we suggest a more specific standard involving modern climate change. Throughout the new curriculum, there are standards involving weather and climate, Earth events, the age of the Earth, human impacts on the environment, and controls on climate over Earth’s space and time. **Despite including these fundamental topics, no standard in the new curriculum specifically connects human actions to current climate change.** For example, standard #2 of the subcategory “Weather and Climate” for grades 9-12 states, “Analyze geoscience data and the results from global climate models to make an evidence based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.” This standard addresses modern climate change but does not recognize that its causes are associated with human activity. The scientific consensus and evidence show that human activity (mainly fossil fuel consumption) is largely the cause of **current** climate change (6). We recommend adding a standard for Grades 9-12 “Weather and Climate” subcategory to make this connection explicit (without negating the effects of natural, cyclic climate change over time). An example of this is: Analyze geoscience data to describe how the causes, rate of change, and effects of present day climate change involves humans, and how this differs from natural climate change throughout Earth’s history.

Concluding Remarks

We, the Penn State Science Policy Society, sincerely thank the many members of the Steering and Content Committees who worked, through the pandemic, to make updating these standards possible. Our above suggestions are offered with the understanding that many hours of thoughtful, intentional, research went into updating the curriculum. We acknowledge that the updates to the science standards will be extremely impactful, and that our suggestions are only meant as considerations to improve that impact. As members of the STEM community, we are greatly appreciative of this work and put forward our support of the regulation.

References

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Regards,
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