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The Virginia Mathematics and Science Coalition (VMSC) appreciates the opportunity to make comments on the guidelines prepared by the Virginia Department of Education on the use of Computer Science (CS) courses to satisfy graduation requirements pursuant to House Bill 1054 (2014). The Coalition notes several key concerns and offers recommendations to the Department on the proposed guidelines.

1. The Coalition does not support replacing a traditional science course with a computer science course as a general principle. Indeed, HB1054 does not require the Board to make such a substitution, but rather provides flexibility to the Board to consider computer science course as a science course. Any science course in Virginia must emphasize scientific inquiry and research (Science SOL x.1). Computer Science courses fail to include the kind of laboratory-based experimentation, and scientific inquiry, while they certainly can include research, data analysis, scientific writing and communication. Those differences are a concern for our organization.

2. The Coalition appreciates the effort reflected in the proposed guidelines to integrate experimental design research in a computer science course that would serve as science course credit. This will enable students to investigate various algorithms; computational, mathematical, or statistical methods; or analyze data sets using various tools. Students should be encouraged to generate and use data in innovative ways to enhance computational, experimental, observational, and theoretical scientific discovery and application.

3. The VMSC recognizes the importance of increasing the number of students with an interest in and the preparation for entering computer science programs in college to pursue careers in this rapidly expanding and financially lucrative field. However, the substitution of a computer science credit for a laboratory science credit is incompatible with undergraduate admission requirements to colleges and universities, which require at least three years of college preparatory math and at least two years of laboratory science. The Coalition recommends that college-bound students receive strong and timely counseling before substituting a computer science credit for a science credit, as opposed to using it as an elective credit. Many colleges and universities would like to see three years of laboratory

(over)

science and, having one credit being computer science, may adversely impact admission to that college or university of the student's choice.

4. The Coalition encourages a comprehensive evaluation of graduation requirements when the Standards of Accreditation are reviewed to ensure that all students are receiving the strong foundation needed to succeed in a variety of STEM careers, including computer science.

5. The Coalition has a twenty-five year history of a) providing research-based information on STEM curricula, b) providing statewide professional development for teachers, and c) articulating the conditions essential for success including adequate instructional time and graduation requirements. The Coalition offers its expertise and assistance to meet the short term need of preparing computer science teachers to meet these guidelines and the longer term need of ensuring that students have the strong foundation to succeed in all STEM careers.

The Virginia Mathematics & Science Coalition (VMSC) is a nonprofit 501(c) (3) organization dedicated to achieving excellence in mathematics and science education for Virginia's K-12 and higher education students. As part of its mission, the VMSC evaluates policies, regulations and practices that impact the quality of mathematics and science education, provides information and analyses, and comments, when necessary, on public policy issues and initiatives addressing preparation for STEM-oriented careers.

For additional information, please contact Fred Hoffman at [president@vmsc.org](mailto:president@vmsc.org).

Julia Cothron, chairman

Fred Hoffman, president