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State Superintendent of Schools

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TO: Members of the State Board of Education

FROM: Lillian M. Lowery, Ed.D. *lm lowery*

DATE: August 26, 2014

SUBJECT: COMAR 13A.04.09 Program in Science
PERMISSION TO PUBLISH

PURPOSE:

The purpose of this action is to seek permission to publish the amended regulations that govern the Program in Science in elementary, middle and high schools (attached).

HISTORICAL BACKGROUND:

In June 2013 members of the Maryland State Board of Education adopted the Maryland College- and Career-Ready Next Generation Standards. In response to the changes to the science standards, the Code of Maryland Regulations (COMAR) governing science has been modified to reflect the language of the Maryland College- and Career-Ready Standards Next Generation Science Standards.

SUMMARY:

The language in the amended COMAR 13A.04.09 reflect the following changes:

- Skills and Processes is replaced by Scientific and Engineering Practices
- Environmental Science is integrated into Life Science including Biology
- Chemistry and Physics are combined into Physical Sciences

ACTION:

I request that you grant permission to publish amendments to COMAR 13A.04.09.

Attachments

Title 13A STATE BOARD OF EDUCATION

Subtitle 04 SPECIFIC SUBJECTS

Chapter 09 Program in Science

Authority: Education Article, §2-205(h), Annotated Code of Maryland

.01 Science Instructional Programs for Grades Prekindergarten — 12.

A. Each local school system shall:

- (1) Provide in public schools an instructional program in science each year for all students in grades prekindergarten—8; and
- (2) Offer in public schools a science program in grades 9—12 which enables students to meet graduation requirements and to select science electives.

B. **Maryland Science Program.** The comprehensive instructional program shall provide for the diversity of student needs, abilities, and interests at the early, middle, and high school learning years, and shall include the [Maryland Science Content Standards] *Maryland College- and Career-Ready Next Generation Science Standards (NGSS)* set forth in §§C—[H]G of this regulation.

C. [Skills and Processes] *Scientific and Engineering Practices.* Students shall demonstrate [the thinking and acting inherent in the practice of science] *an understanding by engaging in scientific investigation that requires not only skill but also knowledge that is specific to each practice.*

D. **Earth/Space Science.** Students shall [use scientific skills and processes to explain the chemical and physical interactions, that is, natural forces and cycles and transfer of energy, of the environment, Earth, and the universe that occur over time] *demonstrate an understanding of the processes that operate on Earth and address its place in the solar system and galaxy.*

E. **Life Science including Biology and Environmental Science.** Students shall [use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time] *demonstrate an understanding of the key concepts that make sense of the life sciences which focus on patterns, processes, and relationships of living organisms.*

F. [Chemistry] *Physical Sciences.* Students shall [use scientific skills and processes to explain the composition, structure, and interactions of matter in order to support the predictability of structure and energy transformations] *demonstrate an understanding that there are mechanisms of cause and effect in all systems and processes that can be understood through a common set of physical and chemical principles.*

G. [Physics. Students shall use scientific skills and processes to explain the interactions of matter and energy and the energy transformations that occur.] *Engineering, Technology, and Applications of Science.* Students shall demonstrate an understanding by engaging in solving complex problems that include issues of social and global significance with an emphasis on identifying the best solution to a problem, which often involves researching how others have solved it before in complex problems.

[H. **Environmental Science.** Students shall use scientific skills and processes to explain the interactions of environmental factors, living and nonliving, and analyze their impact from a local to a global perspective.]

[I. **H. Curriculum Documents.** Consistent with Education Article, §4-110, Annotated Code of Maryland, each local system shall provide science curriculum documents for the elementary and secondary schools under its jurisdiction that:

- (1) Include the [content standards] *Maryland College- and Career-Ready Next Generation Science Standards (NGSS)* set forth in §§C—[H] G of this regulation; and

- (2) Are aligned with the [State Curriculum] *Maryland College- and Career-Ready Next Generation Science Standards (NGSS)*, as developed by the Maryland State Department of Education in collaboration with local school systems.

J. **Student Participation.** Each student shall [have the opportunity to] participate in the comprehensive science program required by this chapter.

.02 Certification Procedures.

By September 2005 and each 5 years after that, each local superintendent of schools shall certify to the State Superintendent of Schools that the instructional programming within grades prekindergarten—12 meets, at a minimum, the requirements set forth in Regulation .01 of this chapter.

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State Superintendent of Schools

IMPACT STATEMENTS

Part A
(check one option)

Estimate of Economic Impact

The proposed action has no economic impact.

OR

The proposed action has an economic impact. Complete the following form in its entirety.

I. Summary of Economic Impact.

Curriculum development and curriculum resources aligned to the new standards will need to be developed by local school systems and the Maryland State Department of Education. The curriculum team at the Maryland State Department of Education will incorporate this into their current work.

New science assessments for grades 5, 8, and the High School Assessments will need to be developed when the science standards are fully implemented in 2017-2018.

II. Types of Economic Impacts.

Revenue (R+/R-)
Expenditure (E+/E-) Magnitude

A. On issuing agency:

Assessments =

B. On other State agencies:

C. On local governments:

Local School Systems

Benefit (+)
Cost (-) Magnitude

D. On regulated industries or trade groups:

E. On other industries or trade groups:

F. Direct and indirect effects on public:

III. Assumptions. (Identified by Impact Letter and Number from Section II.)
Local school systems will update their curriculum documents and resources using the same procedures as they have used with other curriculum updates.

Part B
(check one option)

Economic Impact on Small Businesses

The proposed action has minimal or no economic impact on small businesses.

or

The proposed action has a meaningful economic impact on small businesses. An analysis of this economic impact follows.

Impact on Individuals with Disabilities
(Check one option)

The proposed action has no impact on individuals with disabilities.

or

The proposed action has an impact on individuals with disabilities as follows:

Part C

(For legislative use only; not for publication.)

- A. Fiscal Year in which regulations will become effective: **FY2016**
- B. Does the budget for fiscal year in which regulations become effective contain funds to implement the regulations?
- Yes No
- C. If A yes, @ state whether general, special (exact name), or federal funds will be used:
- D. If A no, @ identify the source(s) of funds necessary for implementation of these regulations: Local funds will be needed to support local curriculum development; state funds will be necessary to develop new assessments aligned to the new science standards. These will replace the current Maryland School Assessment (MSA) for science in grades 5 and 8, and the high school assessment for biology.
- E. If these regulations have no economic impact under Part A, indicate reason briefly:
- If these regulations have minimal or no economic impact on small businesses under Part B, indicate the reason and attach small business worksheet.

Comparison to Federal Standards
(Check one option)

There is no corresponding federal standard to this proposed regulation.

or

There is a corresponding federal standard to this proposed regulation. Please give corresponding federal standard and if the regulation is not more restrictive or stringent give justification.

or

In compliance with Executive Order 01.01.1996.03, this proposed regulation is more restrictive or stringent than corresponding federal standards as follows:

- (1) Regulation citation and manner in which it is more restrictive than the applicable federal standard:

- (2) Benefit to the public health, safety or welfare, or the environment:

- (3) Analysis of additional burden or cost on the regulated person:

- (4) Justification for the need for more restrictive standards: