

Doing the Math:

Are Maryland's High School Math Standards Adding Up to College Success?

BY GABRIELLE MARTINO, PH.D., WITH W. STEPHEN WILSON, PH.D.

Examining the Alignment Among Maryland's Voluntary State Curriculum
for High School Mathematics, the Algebra I High School Assessment,
and the Accuplacer College Placement Tests

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111 S. Calvert Street, Suite 2300
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Executive Summary

The educational standards, instruction, and testing of mathematics remain a controversial subject in the United States. Nationally, there is a documented lack of alignment between the expectations of college professors and the mandates for high school mathematics educators. According to a 2008 report from the National Mathematics Advisory Panel, there is a “vast and growing demand for remedial mathematics education among arriving students in four-year colleges and community colleges across the nation.”¹ This trend has been reported in Maryland where nearly one-third of even the best-prepared high school graduates require mathematics remediation in college. Worse, the problem seems to be increasing: The need for remedial mathematics among Maryland students who take a college-preparatory curriculum in high school and attend Maryland colleges has increased from 23 percent in 1997 to 32 percent in 2007.² These rates vary across districts and student subgroups, and for some subgroups of students, the most recently reported remediation rate is as high as 69 percent.

It is, unfortunately, students who bear the brunt of the gap between the expectations of colleges and high schools. Colleges require remedial students to complete noncredit yet tuition-bearing classes in order to proceed with obtaining a degree. These classes are significant stumbling blocks for many students.

Maryland, like other states, has revamped its standards for mathematics and now offers guidance to educators with the Maryland Voluntary State Curriculum (VSC) for High School Mathematics. Furthermore, as of the graduating class of 2009, all Maryland public school students must pass the High School Assessment (HSA) for Algebra I/Data Analysis in order to earn a high school diploma. Simultaneously, Maryland’s community colleges utilize standardized college-placement testing, namely the College Board’s Accuplacer Test.

Given the significant and growing need for mathematics remediation, it is reasonable to question how well Maryland is preparing its high school students to succeed in post-secondary institutions. Is the state’s VSC for high school mathematics aligned with the skills that colleges are demanding? More specifically, are Maryland’s high school mathematics standards aligned with the placement testing for mathematics used by the state’s community colleges and many of the four-year public colleges and universities?

This evaluation examines the correlation between the skills required to perform well on the Accuplacer college-placement tests and the content covered by the related high school mathematics courses as determined by Maryland’s Voluntary State Curriculum. It also evaluates the relevancy of the recently mandated High School Assessment for Algebra I/Data Analysis.

The remedial mathematics situation is particularly pronounced at Baltimore City Community College where nearly all incoming students are placed into remedial math courses. For this reason, Baltimore City Public Schools and Baltimore City Community College are examined in greater detail in order to provide additional insight about the statewide issue.

The overriding question addressed is: Does successful completion of mathematics courses and the Algebra HSA, as prescribed by the VSC, lead to mastery of the skills required for the Accuplacer tests?

With the exception of the recently updated Algebra II state curriculum, the answer is no.

The findings of this analysis conclude:

- The Voluntary State Curriculum for Algebra I/Data Analysis as currently presented does not prepare a student to perform at a minimally sufficient level on the Accuplacer Elementary Algebra Test.
- There is very little alignment (less than 6 percent) between the kinds of problems on the HSA for Algebra I/Data Analysis and the kinds of problem found on the Accuplacer Elementary Algebra Test.
- The current VSC for Algebra I/Data Analysis and Algebra II as currently presented does not form a particularly cohesive sequence for the learning or teaching of algebra.
- The newly revised VSC for Algebra II and the Accuplacer College Level Math Test are reasonably well aligned.
- Arithmetic proficiency, while not a focus of this study, is a component tested by the Accuplacer tests; students are often inadequately prepared to demonstrate mastery of these skills.

A series of recommendations aimed at reducing the need for post-secondary mathematics remediation is included. It calls for a closer alignment of college and high school mathematics standards, curricula, and testing instruments.