

Decision Brief: Increase Mathematics Requirements to Include Each Year of High School

Background

Currently for a standard diploma, students must earn three standard credits in math, and one verified credit. Courses completed to satisfy this requirement shall include at least two different course selections from among: Algebra I; Geometry; Algebra, Functions and Data Analysis; Algebra II, or other mathematics courses above the level of Algebra II. For an advanced diploma, students must earn four standard credits in math, and two verified credits. Courses completed to satisfy this requirement shall include at least three different course selections from among: Algebra I, Geometry, Algebra II, or other mathematics courses above the level of Algebra II.

Proposal for Consideration

As the Board develops a Profile of a Graduate, it is asked to consider requiring students to take a course involving mathematical thinking and problem solving in each year of high school and have at least three mathematics credits to satisfy graduation requirements. Students would be required to verify one mathematics credit. [Note: Methods of student verification of mathematics credit are not addressed in this proposal.] Options in course selection will provide flexibility that may meet student interests.

Courses completed to satisfy these requirements shall include

PATHWAY I

- Algebra I;
- Geometry;
- Algebra, Functions, and Data Analysis or Algebra II; and
- courses involving mathematical thinking and problem solving[†].

PATHWAY II

- Algebra I;
- Geometry; and
- a two-year sequence in career and technical education that the local school board approves as a course sequence that consistently integrates mathematical thinking and problem solving throughout each course.

Notes:

[†]Courses involving mathematical thinking and problem solving may include

- Board-approved mathematics courses above the level of Algebra I and Geometry; and
- Courses approved by a local school board that consistently integrate mathematical thinking and problem solving throughout the course. Locally-approved courses may include, but are not limited to, those from the areas of computer science, computer programming, engineering, accounting, and finance. Once a student has been awarded a mathematics credit for a locally-approved course, the mathematics credit conveys with the student upon transfer to any other school division in Virginia.

Assumptions:

- A course may not be used to meet both mathematics and science graduation requirements.
- The Economics and Personal Finance course may not be used to satisfy mathematics graduation requirements.

Credit accommodations for eligible students with disabilities would include:

- a requirement that students have three credits from the Board-approved mathematics courses;
- the ability to take Algebra I and/or Geometry in two parts and receive a mathematics credit for each part for a total of up to three mathematics credits; and
- the ability to locally verify Mathematics Standards of Learning assessments.

Explanation

This proposal ensures that students are involved in mathematical thinking and problem solving throughout each year of high school which will better prepare them for college, careers, and citizenship. This proposal supports student transitions from high school to careers and two- and four-year colleges and universities.

Advantages of Action

- While raising the bar for mathematics expectations, the proposal allows for greater flexibility by providing students with course options that meet their interests.
- The proposal may also support schools in increasing enrollment in courses that involve mathematical thinking and problem solving, which reduces the number of students not enrolling in mathematics coursework during their final years of high school.
- Current data reveals some outcomes of the existing system (refer to [Rapid Data Review](#)) when it comes to remediation levels for our graduates, as many time out of math early in high school.

Considerations

- This proposal will require local school boards to review course sequence options in mathematics and approve courses that involve mathematical thinking and problem solving.
- In some school divisions, implementation of this proposal may increase class size and the need for additional teachers (which is already a hard to staff area).
- The Board will still require students who have earned the required verified credit in mathematics in middle school to take an end-of-course mathematics test or substitute test in high school to meet federal accountability requirements.

Legislation/SOL Innovation Committee Recommendations to Consider

In its Fall 2015 Report, the SOL Innovations Committee noted *“high school graduation requirements should be adjusted as needed to conform to the new expectations identified in this Profile. High schools should be redesigned so that students move from attaining core knowledge and skills in the early years to one of several alternative paths toward college and career readiness.”*

Stakeholder Summary

- Education stakeholders expressed general support for broadening student’s exposure to mathematics content in a non-linear structure, but did express concerns about the availability of mathematics teachers and how this proposal would be accomplished. Principals also noted the gaps that can occur when students are accelerated too quickly through math. Educators also noted the need for student interests to be embedded in core content instruction.
- Community college representatives expressed concerns regarding the mathematical preparedness of some of their students.
 - 2013 high school graduates in Virginia and the VCCS Virginia Placement Test (VPT)
 - 13,105/89,503 (14.6%) of high school graduates took the VPT
 - VPT results indicated that 5,650/13,105 students were “not college ready in math” (43.1% of 2013 high school graduates that were VPT takers)
 - 5,650/89,503 “not college ready in math” (6.3% of all 2013 Virginia high school graduates were “not college ready in math.”)
 - The community college system is currently reviewing the effectiveness of the VPT and alternatives to identification of readiness in credit-bearing mathematics coursework.
- During 2014-2015, 70.84% of high school seniors were enrolled in mathematics or computer science courses.

Actions from other States

Twenty-six states and Washington DC currently require four credits in mathematics.

(AL, AZ, AR, CO, CT, DE, DC, FL, GA, HI, IN, LA, MD, MA, MI, MS, MO, NV, NM, NC, OH, RI, SC, TN, TX, WV, WY)

NEXT STEP

- Accept for Immediate Inclusion (First Review in June)
- Approve, but Not Ready for the Initial Phase
- Reject