

## Advanced Math: Closing the Equity Gap

*Minority and low-income students are less likely to have access to, enroll in and succeed in higher-level math courses in high school than their more advantaged peers. Under these circumstances, higher-level math courses function not as the intellectual and practical boost they should be, but as a filter that screens students out of the pathway to success.*

### Education doesn't add up for too many low-income and minority students.

- There are inequities by race. About 71 percent of Black and Hispanic graduates take Algebra II and/or some trigonometry, compared with 83 percent of Asian and 77 percent of white graduates.
- There are also inequities by the socioeconomic status of a school. About 71 percent of students in schools with at least three-quarters of students eligible for free/reduced lunch take Algebra II and/or some trigonometry, compared with 80 percent of students in high-income schools.<sup>1</sup>

### The problem is a lack of opportunity, not ambition.

- Nationally, only about 17 percent of U.S. 12th graders are prepared for and interested in pursuing science, mathematics, engineering or technology (STEM) degrees; another 14 percent are interested in STEM but lack the necessary proficiency in mathematics. Black students are the most likely to be interested in STEM degrees but unprepared in mathematics (about 25 percent compared to 11 percent of White students). They are also the most likely to be neither interested nor prepared for STEM degrees among all races/ethnicities.<sup>2</sup>
- While 82 percent of the schools (in diverse districts) serving the fewest Hispanic and Black students offer Algebra II, only 65 percent of the schools serving the most Black and Hispanic students offer students the same course.
- Similarly, less than a third of high schools serving the most Hispanic and African-American students offer Calculus, compared to 50 percent of all schools.<sup>3</sup>

### Advanced math advances equity.

- In college success: Taking advanced math has a greater influence on whether students will graduate from college than any other factor—including family background. For those who go straight to college, taking advanced math in high school boosts college completion rates from 36 to 59 percent among low-income students and from 45 to 69 percent among Latino students.<sup>4</sup>


$$[X_i - \bar{X}]^2 \partial^2 \Omega$$

- In economic opportunity: Taking advanced mathematics has a direct impact on future earnings. All else being equal, inequities in advanced math courses account for one-quarter of the income gap between students from low-income and middle-class families ten years after graduation from high school.<sup>5</sup>
- Black, male students particularly benefit in terms of annual earnings later on, with each additional mathematics course completed increasing their annual earnings by 8 percent on average.<sup>6</sup>

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## ENDNOTES

- 1 National Center for Education Statistics. (2012). *High School Coursetaking: Findings from The Condition of Education 2012*. Washington, DC: U.S. Department of Education. Indicator 31-2012.
- 2 Business Higher Education Forum (Aug 2011). *Creating the Workforce of Tomorrow: The STEM Interest and Proficiency Challenge*. BHEF Research Brief. [www.bhef.com/publications/documents/BHEF\\_Research\\_Brief-STEM\\_Interest\\_and\\_Proficiency.pdf](http://www.bhef.com/publications/documents/BHEF_Research_Brief-STEM_Interest_and_Proficiency.pdf)
- 3 The Civil Rights Data Collection (2012). *The Civil Rights Data Collection Summary*. The Office for Civil Rights, U.S. Department of Education. <http://www2.ed.gov/about/offices/list/ocr/docs/crdc-2012-data-summary.pdf>
- 4 Adelman, C. (2006, February). *The Toolbox Revisited: Paths to Degree Completion from High School through College*. Washington, DC: U.S. Department of Education. (p. xxvi)
- 5 Rose, H. & Betts, J. R. (2004, May). *The effect of high school courses on earnings*. *The Review of Economics and Statistics*, 86(2), 497-513. (p. 510)
- 6 Goodman, Joshua (2009). *The Labor of Division: Returns to Compulsory Math Coursework*. [http://isites.harvard.edu/fs/docs/icb.topic630262.files/NBER\\_EducGroup.pdf](http://isites.harvard.edu/fs/docs/icb.topic630262.files/NBER_EducGroup.pdf)


$$\sqrt{b^2}$$
$$x - \mu$$