

Opportunity Gap Study: Preliminary Findings Brief

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Introduction

Grades are an important component in ensuring opportunity and access for all students as they establish the level of rigor expected in a course and signal the level of skill development a student has achieved. It would be expected that students with grades in the F and D range would stand lower chances of meeting readiness standards on state assessments, and that students with grades in the C, B, and A range would stand higher chances of meeting readiness benchmarks. However, preliminary findings in this study indicate that even students with the best grades are facing large challenges in reaching Kentucky readiness standards in math. Substantial inequities exist between subgroups in students' chances of reaching readiness standards amongst students who performed similarly in their 7th and 8th grade math courses and 10th and 11th grade math courses. ***Specifically, African American and low income students see substantially lower chances of scoring Proficient on KPREP or meeting the Kentucky CCR math benchmark of 19 on the ACT than their white or wealthier peers who earned the same average letter grade in their math courses. These differences point to barriers for African American and low income students in accessing rigorous instructional experiences in math.***

The sections below describe the high level findings of the analysis and discuss implications of the results. An explanation of the study methodology is also given at the end of the brief.

High Level Findings:

- **Racial disparities exist amongst students who earned the same average letter grade in their 7th and 8th grade math courses in their chances of scoring Proficient on the math section of KPREP.** Between African American and white students who earned the same average letter grade in their 7th and 8th grade math courses, African American students had a lower chance of achieving proficiency on the math section of KPREP across all letter grade categories. For African American students whose average letter grade in their 7th and 8th grade math courses was an A, the chance of scoring Proficient on the math section of KPREP was 25 percentage points lower than that of white students who also earned an A average. In every letter grade category, an African American student's chance of scoring Proficient on the math section of KPREP was the same as that of a white student who earned the next grade lower. For example, the chance of an African American student who earned an average letter grade of a B in their 7th and 8th grade math courses scoring Proficient on the math section of KPREP is the same as the chance of a white student who earned a C average.
- **The gap between white and African American students persists into high school, maintaining the differences seen in middle school in students' chances of meeting readiness standards amongst students who performed similarly in their math courses.** In every letter grade category, African American students had a lower chance of meeting the Kentucky CCR math benchmark of a 19 on the ACT than white students who earned the same average letter grade in their 10th and 11th grade math courses. The gap is similar in magnitude to that seen in middle school, with the chance of an African American student who earned an average letter grade of an A in their 10th and 11th grade math courses being more than 20 percentage points lower than

that of their white peers. The pattern described above in middle school also continues into high school, with an African American student having the same chances of meeting the Kentucky CCR math benchmark as a white student who earned one letter grade lower in their 10th and 11th grade math courses. Additionally, a gap between male and female students develops in high school across all letter grade categories; however, the impact of gender is smaller in magnitude than that of race or income. As an example, female students who earned an average letter grade of an A in their 10th and 11th grade math courses had a chance of meeting the Kentucky CCR math benchmark that was six percentage points lower than male students who earned the same average letter grade.

- **Income level was also found to be a factor in determining different chances of meeting math readiness benchmarks in both middle school and high school for students earning the same average letter grade in their 7th-8th grade and 10th-11th grade math courses.** Across all letter grade categories, low income students were shown to have a lower chance of scoring Proficient on the math section of KPREP than their wealthier peers who earned the same average letter grade in their 7th and 8th grade math courses. For low income students who earned an average letter grade of an A in their 7th and 8th grade math courses, the chance of scoring proficient was about 12 percentage points lower than that of their wealthier peers. The same effect was found for low income students' chances of meeting the Kentucky CCR math benchmark of 19 on the ACT compared to their wealthier peers who earned the same average grade in their 10th and 11th grade math courses. Also, the effect of income increased slightly moving from middle school to high school. In middle school, the difference between the average math letter grades earned by low and higher income students who had the same chance of scoring Proficient on KPREP was less than a full letter grade. In high school, this difference widens to a full letter grade. For example, a low income student who earned a B average letter grade in their 10th and 11th grade math courses had the same chance of meeting the Kentucky CCR math benchmark as a higher income student who earned a C average. In middle school, this difference was less than this full letter grade. Additionally, findings show the combination of race and income had a compounding effect in both middle school and high school, resulting in low income African American students seeing lower chances than their wealthier and white peers for meeting readiness standards on both assessments when earning the same average letter grade in their math courses.
- **A gap also exists between African American and white students in accessing AP math courses during 10th and 11th grade, with African American students seeing a lower rate of enrollment.** During 2015-16 school years, 1720 students in the study's cohort took at least one AP math course during 10th or 11th grade, making up 4.1% of the total cohort of students. Amongst white students in this cohort, 1,461 students, or 4.1%, took an AP math course during their 10th or 11th grade years. However, amongst African American students, only 62 students enrolled in at least one AP math course, or 1.4%. While these numbers do not include the students' senior year course enrollment which is a time when many students are likely to take AP courses, the difference of almost three percentage points indicates African American students do not have the same opportunity to access rigorous math coursework as defined by AP math courses as their white peers.

Implications:

- **The results above demonstrate that in 2012-2016, there was a difference in the connection between the grades and achievement level in math for African American and low income students compared to those of white and wealthier students.** This suggests that grades of

African American and low income students did not signal the same level of achievement in 7th-8th grade and 10th-11th grade math as those of their white or wealthier peers during the time period of the study. Rather, there appears to have been a disconnection between the expected math achievement of African American and low income students and the rigorous instructional experience necessary to ensure proficiency in math.

- **The evidence points to challenges for African American and low income students in gaining access to educational opportunity equal to that of their white and wealthier peers.** One possible explanation for the difference in grading patterns is that the coursework provided to African American and low income students was not as rigorous as that of their white or wealthier peers. While African American and low income students may see high achievement within such an instructional environment and earn higher grades, their academic growth is stunted due to a less robust instructional program. An alternative explanation is that teacher and school leader expectations for African American and low income students were lower than expectations for white or wealthier students. While curriculum and instruction may be rigorous and equal to that of white or wealthy students, lower expectations for African American and low income students would then result in inflated grades that inaccurately reflect student achievement as compared to white and wealthier students.

Summary of Study Methodology

To conduct this analysis, student level data for the current 2016-17 seniors were used, including course grade information from their 7th and 8th grade school years in 2013-2014 as well as that from their 10th and 11th grade school years in 2015-16. Two analyses were conducted, one looking at the relationship between the average letter grade earned in a student's 7th-8th grade math courses and the predicted probability of scoring Proficient on the math section of KPREP. The other analysis examined the relationship between the average letter grade earned in a student's 10th-11th grade math courses and the predicted probability of meeting the Kentucky CCR math benchmark of a 19 on the ACT. The ACT data used for the study are from the state-wide assessment given in March of 2016.

For each student, an average math letter grade was calculated from the letter grades earned during 7th-8th grade math courses. A similar process was followed for math grades earned in 10th-11th grade; however, letter grades were also weighted according to amount of credits earned in the respective course.

In each analysis, student background demographics and Special Status' were controlled for to isolate the effect of the average letter grade earned on the predicted probability of scoring Proficient on the math portion of KPREP or meeting Kentucky's CCR math benchmark.