



Seven Keys to College Readiness Update

Montgomery County Public Schools

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Advanced Placement Examinations as a Key to Postsecondary Success

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Advanced Placement (AP) exam participation and performance are two of the strongest predictors of college coursework preparation and degree completion (Byrd, 2007; Camara & Michaelides, 2005; Geiser & Santelices, 2004; Morgan & Ramist, 1998). Graduates who earn credit for AP courses and exams not only perform as well or better than non-AP graduates upon entry to college but also are more likely to complete a bachelor's degree (Camara, 2003; College Board, 2009a; Dodd, Fitzpatrick, De Ayala, & Jennings, 2002; Hargrove, Godin, & Dodd, 2008; Morgan & Klaric, 2007; Scammacca & Dodd, 2005).


The College Board administers AP exams each May for more than 30 AP courses that are aligned with a comparable college course (College Board, 2009b). Each AP exam—with the exception of the portfolio assessment used for AP Studio Art—is composed of a multiple-choice and a free-response section. The scores from the two sections are combined to form a composite score that is reported as a 5, 4, 3, 2, or 1 (Table 1). Each score represents a test taker's qualification for and expected level of exam performance in a corresponding college course.

Table 1
Interpretation of AP Exam Scores

Exam Score	Qualification for Corresponding College Course	Expected Performance in Corresponding College Course
5	Extremely Well Qualified	Top A-level work
4	Well Qualified	Mid-level A to Mid-level B
3	Qualified	Mid-level B to Mid-level C
2	Possibly Qualified	Below Mid-level C
1	No Recommendation	No Expectation

Source: College Board, 2009c.

Graduates can use qualifying AP exam scores—typically 3 or higher—to earn college credit and/or advanced placement status at more than 90 percent of the nation's colleges and universities and at colleges and universities in more than 30 countries (DiYanni, 2008). Graduates who are awarded college credit for AP exam scores earn course credits toward their college degrees. Graduates who are granted advanced placement status are designated exempt from introductory courses



and/or are recognized as having fulfilled certain general education requirements (e.g., foreign language).

Montgomery County Public Schools (MCPS) encourages students to take at least one AP exam by the end of Grade 12. Although AP exam-taking does not guarantee or predetermine postsecondary success, it is highly correlated with successful postsecondary outcomes. High school students who earn one or more AP exam scores of 3 or higher are less likely to need remediation upon entry to college, and more likely to enroll in college, remain in college, and earn a bachelor's degree (Camara, 2003; Ewing, 2006; Hargrove, Godin, & Dodd, 2008; Scammacca & Dodd, 2005). Awareness of these correlations may influence practical choices that students and parents must make about students' high school programs.

The purpose of this accountability update is to present some of the research and data that support decisions to encourage all high school students to take an AP exam, and to earn a score of 3 or higher by the end of Grade 12. Results are reported for 33,788 students in the MCPS Classes of 2001 to 2004. College readiness and postsecondary outcomes for MCPS graduates are drawn from MCPS records and the National Student Clearinghouse, a research service that provides college enrollment and degree information (National Student Clearinghouse, 2009).

College Remediation

Although about 75 percent of the nation's high school graduates enter college, about one half of college freshman are required to take one or more remedial courses (College Board, 2009a). In Maryland, remediation rates are significant and increasing, even among students who complete a college-preparatory curriculum in high school (Maryland Higher Education Commission, 2009). Nearly one third of Maryland high school graduates are required to take remedial courses in English and/or math upon entry to college (Martino & Wilson, 2009).

The consequences of underpreparation for college coursework are expensive and time-consuming. Unprepared students must pay tuition for remedial courses but the credits earned are not applied toward a degree. Nationally, only about one third of students who are required to take remedial courses upon entry to college also remain in college and earn four-year degrees (Graves, 2008; Strong American Schools, 2008).

Likelihood of Remediation by AP Exam Status

SAT combined scores can be used to estimate the likelihood that students will be required to take remedial mathematics courses upon entry to college. Some colleges may allow students with SAT scores below 550 on each of the critical reading, math, and writing subtests to enroll in credit-bearing English and mathematics courses without prior remediation. However, students who earn SAT subtest scores of 550 or higher can be confident that they are unlikely to need remediation upon entry to college (Figure 1).

Prior to March 2005, the SAT was composed of two subtests—verbal (now critical reading) and math—each of which was scored on a range of 200 to 800 with a mean of 500. Students who earned SAT combined verbal and math scores of 1100 or higher were unlikely to be required to take remedial courses in college. Of students in the MCPS Classes of 2001 to 2004 who earned AP exam scores of 3 or higher, 84 percent earned SAT scores of 1100 or higher and were unlikely to need remediation upon entry to college. In comparison, 36 percent of students with AP exam scores below 3 and 14 percent of students with no AP exam scores, respectively, earned SAT scores of 1100 or higher and were unlikely to need remediation upon entry to college.

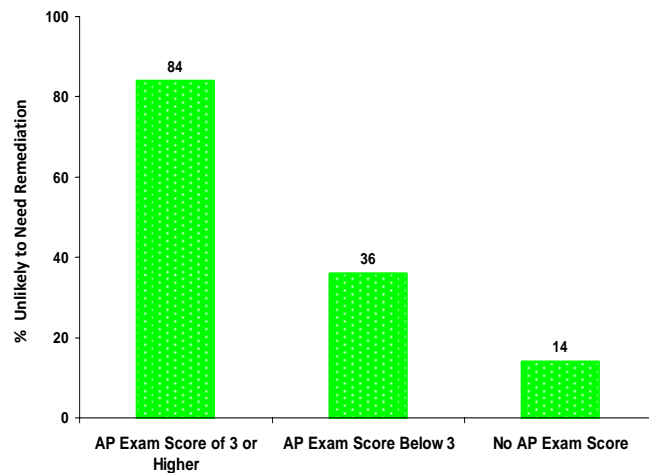


Figure 1. Percentage of graduates in the MCPS Classes of 2001 to 2004 who were unlikely to be required to take a remedial mathematics course upon entry to college (earned SAT scores of 1100 or higher) by AP exam status at the end of Grade 12.

College Enrollment, Persistence, and Degree Attainment

One reason for the high correlation of AP exam participation and performance with postsecondary success is that the rigorous AP

courses and exams are similar to those that students will take in college. Recent studies provide evidence that students who earn AP exam scores of 3 or higher are more likely to graduate from college compared with non-AP students (Dougherty, Mellor, & Jian, 2006; Morgan & Klaric, 2007). Nationally, college success also is greater among students who take an AP exam than among students who leave high school with no AP exam experience (Hargrove, Godin, & Dodd, 2008).

Among students in the MCPS Classes of 2001 to 2004, 94 percent who earned one or more AP exam scores of 3 or higher enrolled in college. Of those students, 86 percent stayed in college (persisted), and 76 percent earned a bachelor's degree within six years. Likewise, 94 percent of students in the MCPS Classes of 2001 to 2004 who took an AP exam but earned scores below 3 enrolled in college, a rate higher than the national average of about 69 percent (Bureau of Labor Statistics, 2009). However, of those students, 79 percent stayed in college, and 60 percent earned a bachelor's degree within six years. Among students who took no AP exam, 77 percent enrolled in college, 48 percent stayed in college, and 25 percent earned a bachelor's degree within six years (Figure 2).

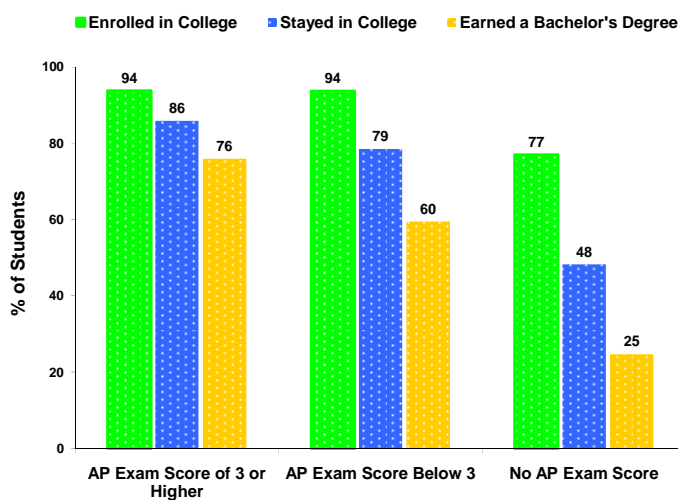


Figure 2. College enrollment, persistence (stayed in college), and degree attainment for graduates in the MCPS Classes of 2001 to 2004 by AP exam status at the end of Grade 12.

Narrowing Racial/Ethnic Differences in College Achievement

AP exam access and opportunity, while a desired outcome for all high school students, is especially important for creating more equitable opportunities for minority students (College Board, 2009a). On average, students who are African American and Hispanic participate

in fewer advanced-level high school courses than their Asian American and White peers and are less likely to earn AP exam scores of 3 or higher (College Board, 2006, 2009a). This leaves African American and Hispanic students less prepared for college-level coursework. As is true nationally, MCPS African American and Hispanic students in the Classes of 2001 to 2004 were less likely to be exempt from taking remedial courses upon entry to college compared with Asian American and White students (Table A1).

The correlation between AP exam participation and college degree attainment was most striking for African American and Hispanic students. About one in four Asian American and one in three White students in the MCPS Classes of 2001 to 2004 who took no AP exam earned a bachelor's degree within six years compared with about one out of every five African American students and one out of every nine Hispanic students (Figure 3).

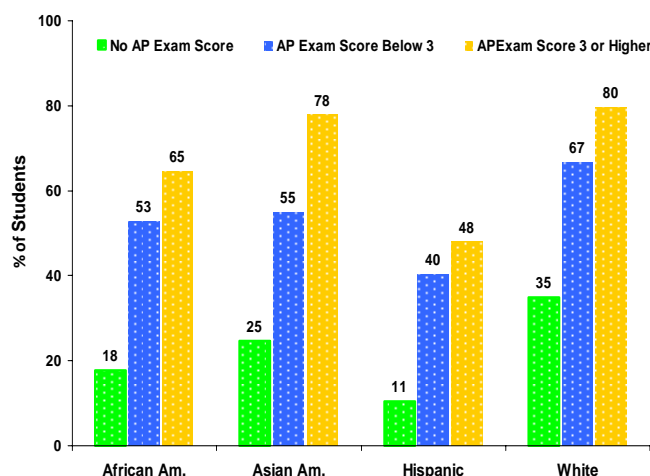



Figure 3. Percentage of graduates in the MCPS Classes of 2001 to 2004 who earned a bachelor's degree within six years by race/ethnicity and AP exam status.

African American students who earned one or more AP exam scores of 3 or higher earned college degrees at rates that were more than three times those of African American students who took no AP exam. African American students who took an AP exam but received scores below 3 earned college degrees at rates that were nearly three times those of African American students who took no AP exam.

Hispanic students who earned one or more AP exam scores of 3 or higher earned college degrees at rates that were more than four times those of Hispanic students who took no AP exam. Hispanic students who took an AP exam but received scores below 3 earned college



degrees at rates that were more than three times those of Hispanic students who took no AP exam.

Discussion

MCPS has identified attainment of an AP exam score of 3 or higher as one of the Seven Keys to College Readiness. AP exam performance is associated with a greater likelihood of four postsecondary outcomes: college readiness, college enrollment, college persistence, and college degree completion (Tables A1 to A4).

While AP exam participation and performance are highly correlated with postsecondary success, they are not the only indicators of high school students' college readiness. Many students who do not take an AP exam, or who take an AP exam and score below 3, are successful in college and the workplace. Opportunity to learn, targeted instruction, student motivation, and many other factors influence performance during and after high school. Parents, teachers, and school leadership should consider multiple sources of information, including evidence from day-to-day interactions with students, to identify individuals' strengths and support students' college readiness during high school and beyond.

High school graduates who earned one or more AP exam scores of 3 or higher were more likely to—

- be prepared for college-level courses;
- enroll in college;
- remain in college; and
- earn a bachelor's degree within six years.

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Table A1
Number of MCPS Graduates and Number and Percentage of MCPS Graduates Who Were Unlikely To be Required to Take Remedial Courses Upon Entry to College^a by Race/Ethnicity and Advanced Placement Exam Status

Graduation Class Race/Ethnicity	AP Exam Score of 3 or Higher			AP Exam Score Below 3			No AP Exam Score		
	N MCPS Graduates	N Unlikely Remedial	% Unlikely Remedial	N MCPS Graduates	N Unlikely Remedial	% Unlikely Remedial	N MCPS Graduates	N Unlikely Remedial	% Unlikely Remedial
Classes of 2001 to 2004	12,546	10,522	83.9	2,925	1,044	35.7	18,317	2,467	13.5
African American	814	509	62.5	551	97	17.6	5,127	239	4.7
Asian American	2,631	2,318	88.1	604	194	32.1	2,034	296	14.6
Hispanic	885	379	42.8	239	40	16.7	3,090	120	3.9
White	8,199	7,305	89.1	1,525	711	46.6	8,004	1,804	22.5

Note. Results for American Indian students are included with all students but not reported separately. AP exam status and remedial likelihood are based on data available in MCPS student records.

^a Students were defined as unlikely to be required to take remedial mathematics courses upon entry to college if they earned SAT combined verbal and math scores of 1100 or higher. Students who did not take an SAT were included in the group that may be required to take a remedial mathematics course.

Table A2
Number of MCPS Graduates and Number and Percentage of MCPS Graduates Who Enrolled in College^a by Race/Ethnicity and Advanced Placement Exam Status

Graduation Class Race/Ethnicity	AP Exam Score of 3 or Higher			AP Exam Score Below 3			No AP Exam Score		
	N MCPS Graduates	N Enroll	% Enroll	N MCPS Graduates	N Enroll	% Enroll	N MCPS Graduates	N Enroll	% Enroll
Classes of 2001 to 2004	12,546	11,763	93.8	2,925	2,742	93.7	18,317	14,102	77.0
African American	814	747	91.8	551	497	90.2	5,127	3,753	73.2
Asian American	2,631	2,456	93.3	604	553	91.6	2,034	1,633	80.3
Hispanic	885	738	83.4	239	217	90.8	3,090	2,009	65.0
White	8,199	7,806	95.2	1,525	1,469	96.3	8,004	6,658	83.2

Note. Results for American Indian students are included with all students but not reported separately. AP exam status is based on data available in MCPS student records. College enrollment status is based on data obtained from the National Clearinghouse in November 2009. Postsecondary records were not available for all graduates. ^a College enrollment is defined as enrolling in a two- or four-year college within six years after high school graduation.

Table A3
Number of MCPS Graduates and Number and Percentage of MCPS Graduates Who Persisted in College^a by Race/Ethnicity and Advanced Placement Exam Status

Graduation Class Race/Ethnicity	AP Exam Score of 3 or Higher			AP Exam Score Below 3			No AP Exam Score		
	N MCPS Graduates	N Persist	% Persist	N MCPS Graduates	N Persist	% Persist	N MCPS Graduates	N Persist	% Persist
Classes of 2001 to 2004	12,546	22,271	85.9	2,925	4,841	78.5	18,317	19,150	48.3
African American	814	1,344	77.8	551	884	69.7	5,127	4,741	41.9
Asian American	2,631	4,940	87.2	604	1,059	78.5	2,034	2,526	54.1
Hispanic	885	1,396	68.7	239	373	73.6	3,090	2,570	34.8
White	8,199	14,555	88.1	1,525	2,513	82.3	8,004	9,272	56.3

Note. Results for American Indian students are included with all students but not reported separately. AP exam status is based on data available in MCPS student records. College persistence status (remaining in college) is based on data obtained from the National Clearinghouse in November 2009. Postsecondary records were not available for all graduates.

^a College persistence is defined as continued college enrollment even if a degree was not obtained during the six years after high school graduation.

Table A4
Number of MCPS Graduates and Number and Percentage of MCPS Graduates Who Earned a Bachelor's Degree^a Within Six Years by Race/Ethnicity and Advanced Placement Exam Status

Graduation Class Race/Ethnicity	AP Exam Score of 3 or Higher			AP Exam Score Below 3			No AP Exam Score		
	N MCPS Graduates	N Earn Degree	% Earn Degree	N MCPS Graduates	N Earn Degree	% Earn Degree	N MCPS Graduates	N Earn Degree	% Earn Degree
Classes of 2001 to 2004	12,546	9,535	76.0	2,925	1,740	59.5	18,317	4,528	24.7
African American	814	525	64.5	551	291	52.8	5,127	915	17.8
Asian American	2,631	2,050	77.9	604	332	55.0	2,034	500	24.6
Hispanic	885	425	48.0	239	96	40.2	3,090	324	10.5
White	8,199	6,525	79.6	1,525	1,017	66.7	8,004	2,783	34.8

Note. Results for American Indian students are included with all students but not reported separately. AP exam status is based on data available in MCPS student records. College degree completion status is based on data obtained from the National Clearinghouse in November 2009. Postsecondary records were not available for all graduates.

^a College degree completion is defined as a bachelor's degree or higher from a four-year institution.