COLLEGE READINESS

Benefits of a High School Core Curriculum

A Joint Report by the Council of the Great City Schools and ACT

Council of the Great City Schools

ACT®

Benefits of a High School Core Curriculum

for Students in Urban High Schools

Council of the Great City Schools
and ACT, Inc.

Council of the Great City Schools is a coalition of 66 of the nation's largest urban public school systems. Founded in 1956 and incorporated in 1961, the Council is located in Washington, D.C., where it works to promote urban education through legislation, research, media relations, instruction, management, technology, and other special projects designed to improve the quality of urban education. The Council serves as the national voice for urban educators, providing ways to share promising practices and address common concerns.

ACT is an independent, not-for-profit organization that provides assessment, research, information, and program management services in the broad areas of education and workforce development. Each year ACT serves millions of people in high schools, colleges, professional associations, businesses, and government agencies, nationally and internationally. Though designed to meet a wide array of needs, all ACT programs and services have one guiding purpose—helping people achieve education and workplace success.

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Introduction

This report focuses on the role of the college–preparatory curriculum in improving the academic achievement and college readiness of students from high schools in the member districts of the Council of the Great City Schools. Specifically, the report addresses the following questions:

- Is taking a core college-preparatory curriculum and additional courses beyond the core associated with increased academic achievement and college readiness for urban students?
- Is greater readiness for college related to increased college enrollment and increased college persistence among urban students?

The remainder of this introduction discusses the background against which these questions have taken on such urgency in recent years—and the reasons for the answers to these questions becoming of critical importance to the nation at large.

College Readiness: A National Challenge

Improving college readiness is vital to the development of a diverse and talented labor force that can maintain and increase U.S. economic competitiveness throughout the world. In addition to providing a stronger workforce for our nation, improved college readiness will provide a better and more rewarding quality of life for our citizens.

What do we mean by college readiness? ACT uses the phrase to refer to the level of preparation a student needs to be equipped to enroll and succeed—without remediation—in a credit-bearing first-year course at a two-year or four-year institution, trade school, or technical school.

Today it has become clearer that college readiness also means readiness for workforce training programs beyond high school. Although not every student plans to attend college after high school, many of the jobs now being created in a technology-based economy require a level of knowledge and skills comparable to that expected of the first-year college student (ACT, 2006c). Therefore, college and work readiness should be expected not only from traditional college-bound high school graduates, but from *all* high school graduates.

It is important to ensure that all students are ready for college or for workforce training—and especially important to address the substantial disparities in college readiness among students from various racial

and ethnic backgrounds, geographical locations, types of schools, and ranges of family income (ACT, 2006a). In light of changing U.S. demographics, special emphasis must be placed on preparing students of all backgrounds in greater numbers for the kinds of highly skilled scientific and technological careers that are emerging in today's global economy.

The Value of a College Education

In the current economic climate, having a college education creates many opportunities that are unavailable to students with only a high school education. Occupational projections from 2004 to 2014 indicate that 80 percent of the fastest-growing occupations will require a minimum of an associate's degree and 36 percent will require a bachelor's degree. In comparison, only 37 percent of new jobs will be geared toward those with a high school diploma or less (Hecker, 2005). Jobs that require more advanced skills are expected to grow twice as fast as those that require basic skills (Somerville & Yi, 2002).

Wage earnings increase sharply with a college education. For workers aged 25 to 34 years, the average income of those with a bachelor's degree is almost double that of high school graduates. Those who attend college without obtaining a college degree earn 5 to 11 percent more than do students with only a high school diploma. Those who earn an associate's degree earn 20 to 30 percent more than do those with only a high school education (Carnevale & Desrochers, 2003; U.S. Census Bureau, 2006).

A college education provides many other, less tangible benefits to individuals and to society. For example, workers with a college education have a lower risk of unemployment and have greater access to on-the-job training and technology than do those with a high school diploma or less. College graduates are also almost twice as likely as are high school graduates to receive formal training once they are employed (Organisation for Economic Co-operation and Development, 2005). Postsecondary education is also associated with greater productivity in the workplace; better health; greater civic involvement, trust, tolerance, and ability to cope with stressful situations; and a greater likelihood of having a fulfilling job (Organisation for Economic Co-operation and Development, 2005).

Inequalities in College Enrollment, Remedial Course-Taking in College, and Persistence in College

Current education and workforce projections indicate that postsecondary education is necessary for the economic success of both individuals and society. However, despite the importance of postsecondary education, many high school students graduate inadequately prepared for college-level courses—especially low-income students and students from underrepresented racial/ethnic minority groups. These students are less likely than other students to take a college-preparatory curriculum in high school and to graduate prepared for college-level work. Compared with other students, African American and Hispanic high school graduates are less likely to enroll in college (Green & Forster, 2003) and more likely to take remedial courses when they do enter college (ACT, 2004; Green & Forster, 2003). Students who take remedial courses in college are also more likely to drop out before earning a degree (McCabe, 2000; U.S. Department of Education, 2001). ACT-tested racial/ethnic minority students also have lower levels of college persistence than do other ACT-tested students (ACT, in press).

College enrollment. Nationally, between 57 percent and 75 percent of students enroll in college. The enrollment rate depends on the population under consideration and the length of time between high school graduation and college enrollment (e.g., Adelman, 2004; Ruppert, 2003). Of ACT-tested students nationwide, approximately two-thirds enroll in college the fall after high school graduation. An additional 7 percent of these students delay enrollment until the following fall (ACT, in press).

Immediate college enrollment rates are higher for White students than for African American and Hispanic students, and higher for students with higher family incomes (ACT, in press). Moreover, students who delay college enrollment are at a greater risk of not completing a postsecondary program (Horn, Cataldi, & Sikora, 2005). In other words, racial and income-related differences in immediate college enrollment may exacerbate existing gaps in college completion.

Remedial coursework. Nationally, about one-third of high school graduates who enroll in college take remedial courses (Parsad & Lewis, 2003). Although in recent years remediation rates have declined for four-year institutions, the rates have remained steady for two-year colleges. Taking remedial courses delays completion of educational programs and increases the cost of completing these programs, because students typically cannot earn credit for remedial coursework. The end results are higher college dropout rates and lower program

completion rates for students who enter college underprepared. According to Adelman (2004), 70 percent of students who take one or more remedial reading courses fail to attain a college degree or certificate within eight years of enrolling.

Of particular concern is the finding that many students who graduate from high school unprepared for first-year college coursework have to take multiple remedial courses in college, both within and across subject areas. For example, of students who take remedial reading, more than one-half take four or more remedial reading courses and more than two-thirds also take remedial mathematics; of students who take remedial mathematics, more than 70 percent take two or more remedial mathematics courses (Adelman, 2004; Carey, 2004). Racial/ethnic minority students are almost twice as likely to take one or more remedial courses in college as are White students.

Persistence to a second year of college. The vast majority (84 percent) of ACT-tested students who enroll in college return for their second year, to either the same or a different institution (ACT, in press). This finding is consistent with national retention rates for first- to second-year persistence (88 percent; Adelman, 2004). But White students are more likely to persist to their second year than are African American students, and are slightly more likely to do so than are Hispanic students. In addition, as family income increases, first- to second-year retention rate also increases (ACT, in press).

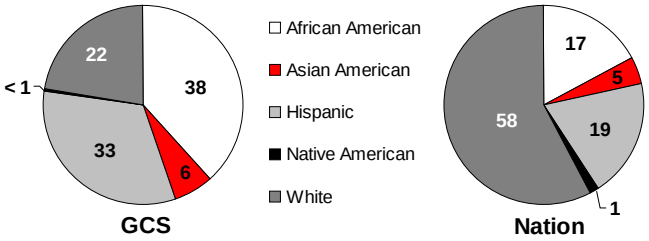
Persistence to a college degree. Roughly 50 to 60 percent of entering students graduate from college within six years; about a half-million students every year fall short of graduation (Carey, 2004; National Center for Public Policy and Higher Education, 2004). However, racial/ethnic minority students are less likely to complete a college degree than are other students. Adelman (2004) followed 1992 high school graduates for eight years and found that college degree completion rates for Hispanic and African American students were about one-half the magnitude of those for White students.

In today's competitive global economy, these educational disparities can no longer be tolerated (Ohio Business Roundtable, 2006; Peter D. Hart Research Associates/Public Opinion Strategies, 2005). U.S. students of all racial/ethnic backgrounds and family income ranges must possess the knowledge and skills to be able to compete in a global economy, especially in rapidly growing fields—such as engineering and computer technology—that require a solid background in mathematics and science.

The Crucial Role Played By Urban Schools

Given the diverse racial/ethnic and socioeconomic makeup of many of the largest cities in the United States, urban school districts in the nation face a disproportionate share of the challenges involved in preparing high school students for college and work. The Council of the Great City Schools, a coalition of 66 of the nation's largest urban school districts[1], recognizes and supports the efforts of schools in larger U.S. cities to educate their students to the standard of readiness needed in today's society.

As expressed by the Council, the mission of America's urban public schools is "to educate the nation's most diverse student body to the highest academic standards and prepare [urban students] to contribute to our democracy and the global community" (Council of the Great City Schools, 2005, p. 8). Compared with the population of all U.S. public schools, the population of the Council's member districts is more racially and ethnically diverse, more likely to be eligible for free or reduced-price school lunches, and more likely to come from homes in which languages other than English are exclusively or primarily spoken. Following is a summary of selected demographic characteristics of the Council's member school districts (GCS) and the U.S. public school population as a whole.



Characteristic	Great City Schools	Nation
Race/ethnicity		
African American	38%	17%
Asian American	6%	5%
Hispanic	33%	19%
Native American	< 1%	1%
White	22%	58%
Eligible for free/reduced-price lunch	64%	37%
English language learners	17%	8%

Note: The information in this table is taken from *2004–2005 Annual Report*, by Council of the Great City Schools, 2005, Washington, DC: Council of the Great City Schools; and *Overview of Public Elementary and Secondary Students, Staff, Schools, School Districts, Revenues, and Expenditures: School Year 2004–05 and Fiscal Year 2004,* (NCES 2007-309), by J. Sable and J. Hill, 2006, Washington, DC: National Center for Education Statistics.

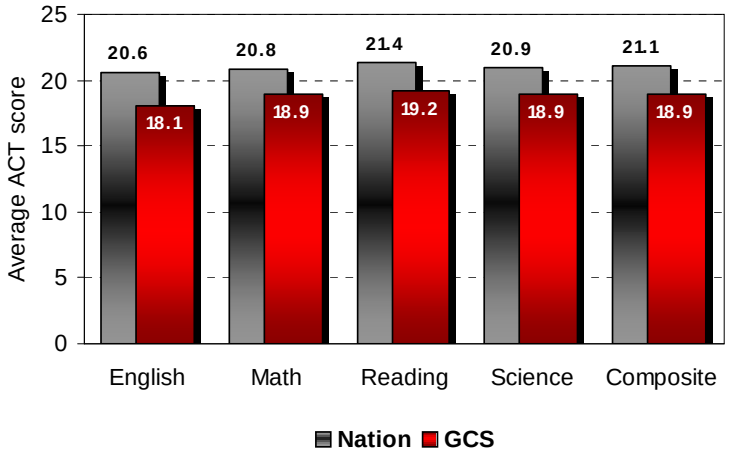
[1] Please see the Appendix for a complete list of the member districts.

The Council's districts serve about 15 percent of the nation's students, 29 percent of its minority students, 27 percent of students receiving free or reduced-price school lunches, and 30 percent of all English language learners (Casserly, 2006).

Just as the overall student population of Great City Schools differs from the overall population of all U.S. public schools, ACT-tested graduates of Great City Schools differ from ACT-tested graduates of high schools nationally in terms of racial/ethnic composition and family income. In 2006, White students comprised 69 percent of all ACT-tested graduates and only 25 percent of Great City Schools graduates. Nearly 1 in 2 ACT-tested graduates of Great City Schools came from a family with an annual income of less than $30,000, compared with about 1 in 4 nationally (see Appendix, Table 1).

Between 2000 and 2006, the racial/ethnic composition of ACT-tested students in the Great City Schools changed slightly. The percentages of African American and Hispanic test-takers increased by 1 and 4 percentage points, respectively, while the percentages of Asian American and White test-takers decreased by 1 and 4 percentage points, respectively. These changes were caused in part by changes in district membership (more districts were members of the Council of Great City Schools in 2006 than in 2000). In addition to increased numbers of twelfth-grade students in the districts (approximately 384,500 in 2005 vs. 340,000 in 2000), proportionally more students took the ACT (27 percent in 2005 vs. 21 percent in 2000). These changes might explain the slight decreases in average ACT scores from 2000 to 2005, as shown across Tables 2, 3, and 5 of the Appendix: ACT research has shown that as the percentage of tested students increases, average ACT scores decrease due to the fact that relatively more lower-achieving students are tested.

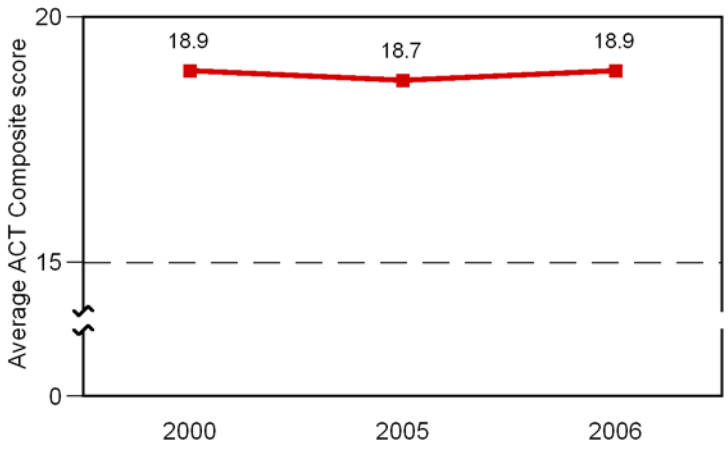
Average ACT Scores for High School Graduates from Great City Schools and Across the Nation (2006)



Between 2005 and 2006, this trend was reversed: Average ACT scores rose slightly despite increasing numbers of ACT-tested students. This finding may indicate that some positive changes are happening in the Great City Schools.

In keeping with the mission of urban schools, one of the Council's goals is "to see that all citizens receive an education that will equip them with the skills and knowledge to compete successfully in the world marketplace and to enhance the quality of their lives in a society changing with phenomenal speed" (Council of the Great City Schools, 2005, p. 6). One of the primary ways of helping to make this goal a reality for high school graduates is to increase their readiness for college.

Average ACT Composite Scores of 2000, 2005, and 2006 Great City Schools Graduates



To help students become ready for college and the workplace, we must ensure that they have solid academic preparation. Typically, such preparation consists of the courses students take in high school. Based in part on the recommendations contained in *A Nation at Risk* (National Commission on Excellence in Education, 1983), ACT has long recommended that all high school students take at least a minimum recommended core curriculum, because of its association with student preparation for college and student success in the first year of college.

The High School Core Curriculum

Among the motivations behind the federal government's publication of *A Nation at Risk* were the desire to see more students graduate from high school prepared for college and work and the need for more students to attend college. Another motivation was the importance of enabling more first-year college students to succeed in college, that is, to perform well in their college courses, return to college for their second year (and beyond), and earn a college degree. The authors of *A Nation at Risk* proposed, among other recommendations, that every high school in the United States require its graduates to take a "core" curriculum: a minimum number of courses designed to provide

ACT's Recommended Core Curriculum

- English: at least four years (typically English 9 through 12)
- Mathematics: at least three years (typically Algebra I, Geometry, and Algebra II)
- Social studies: at least three years (typically U.S. History, World History, and U.S. Government)
- Natural sciences: at least three years (typically General Science, Biology, and Chemistry)

students with a "foundation of success for the after-school years" (National Commission on Excellence in Education, 1983, p. 24). This foundation would consist of universal knowledge and skills that graduates would be able to put to good use regardless of their specific educational or work objectives.

The commission identified the minimum number of basic courses as four years of English, three years of mathematics, three years of science, three years of social studies, and one-half year of computer science. Two years of a foreign language were also strongly recommended for college-bound students (National Commission on Excellence in Education, 1983). The ACT-recommended high school core curriculum consists of four years of English and three years each of mathematics, science, and social studies. ACT research has consistently shown that high school students who take this recommended core curriculum are more likely to be prepared for college when they graduate than are students who do not take the core curriculum. Decades of research bear out this recommendation.

It is also evident that taking the right *kind* of courses matters just as much as taking the right *number* of courses. The academic quality and intensity of the high school curriculum is a key determinant of success in postsecondary education (ACT, 2004; ACT, 2005; Adelman, 2006). ACT-tested students who take additional higher-level courses beyond the core—such as Physics and mathematics courses beyond Algebra II—achieve higher ACT scores than do students who take only the recommended core.

In the first two chapters of this report, we show the estimated benefits of the ACT-recommended core curriculum for ACT-tested high school graduates of the 66 member school districts of the Council of the Great City Schools. We examined these districts as an aggregate. Chapter 1 describes the relationship between taking the ACT-recommended core curriculum (as well as specific high school courses) and achievement in high school and readiness for college. Chapter 1 includes the following key findings:

- Students in the Great City Schools who take the core college-preparatory curriculum score higher on the ACT, and are more likely to be ready for college, than students who do not take the core curriculum.

- Taking the core curriculum and higher-level courses beyond the core in a particular subject area is associated with improved college readiness for students in the Great City Schools. The higher the level of courses that students in the Great City Schools take in high school, the more likely they are to be ready for college.

- Taking higher-level courses is associated with increased achievement for all students, after controlling for their prior academic performance.

Chapter 2 describes the relationship between taking the ACT-recommended core curriculum and two college success indicators—college enrollment and persistence to a second year at the same institution—and includes the following key findings:

- Students in the Great City Schools who take the core curriculum are more likely to enroll in college than are students who do not take the core curriculum.

- Students in the Great City Schools who take a core curriculum are more likely to return to the same postsecondary institution their second year than are students who do not take a core curriculum.

Unless otherwise specified, the results reported in this document are based on approximately 107,000 ACT-tested students of Great City Schools who graduated from high school in 2006. Of these students, 61 percent[2] took the ACT-recommended core curriculum. The percentage of ACT-tested students nationally who took the core curriculum was also 61 percent in 2006 (Table 4 of the Appendix).

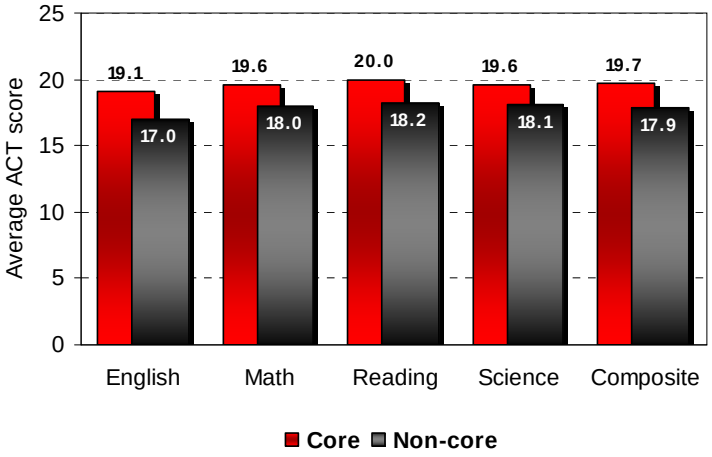
In Chapter 3, we recommend a number of action steps for improving college readiness based on our observations of the Great City Schools and on earlier research.

[2] This percentage is based on ACT-tested students who reported their course-taking information.

1

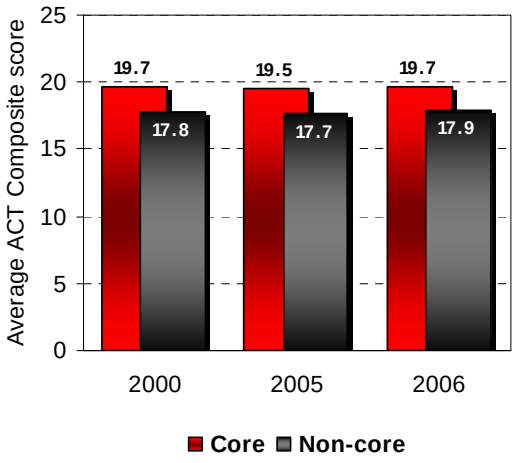
Improvements in Academic Achievement and College Readiness

Figure 1: Average ACT Scores of Great City Schools Graduates



Students in the Great City Schools who take a core curriculum score higher on the ACT, and are more likely to be ready for college, than are students who do not take a core curriculum.

Figure 2: Average ACT Composite Scores of 2000, 2005, and 2006 Great City Schools Graduates



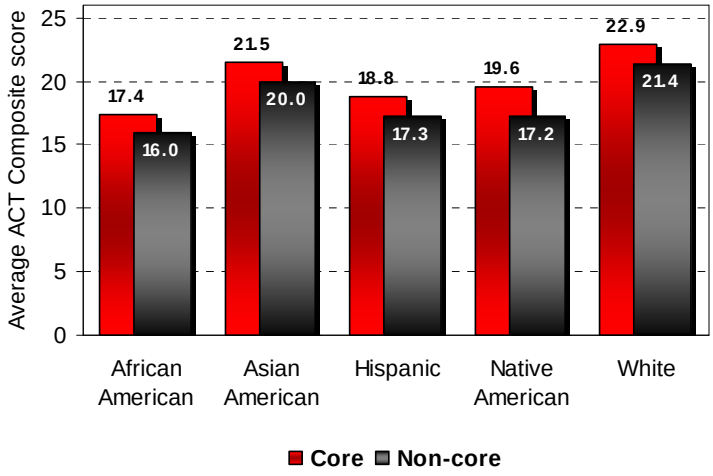
Data gathered by ACT show that taking the ACT-recommended core curriculum is positively related to the academic achievement of students across the nation, as well as students in the Great City Schools. Compared with graduates of Great City Schools who do not take the core curriculum in high school, those who take the core curriculum achieve ACT scores that are 1.5 to 2.1 points higher (Figure 1).[3,4] The results were similar for 2000, 2005, and 2006 (Figure 2).

[3]These score-point differences are substantial given that ACT scores range from 1 to 36 (the highest score).

[4]The results presented in this report were based on all ACT-tested high school graduates of the member districts. Due to the large size of the population, most differences would be expected to be statistically significant, even those that are small for all practical purposes. Therefore, the results were not tested for statistical significance and are reported here for descriptive purposes only.

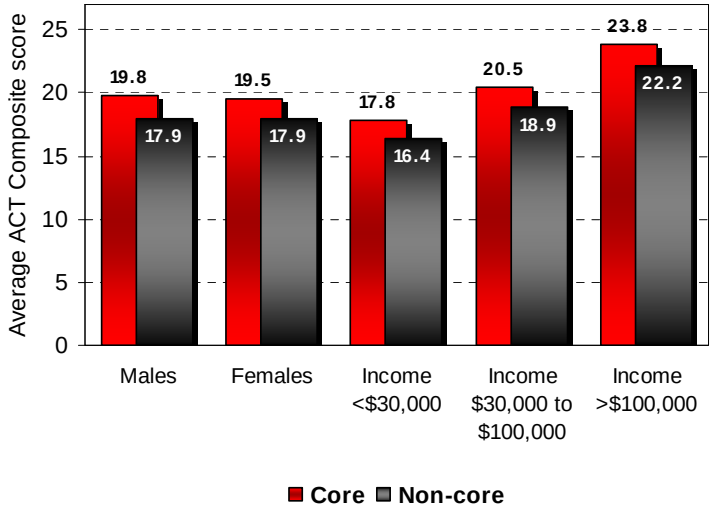
One can see these improvements in student achievement for both genders and all racial/ethnic groups and family income ranges. Depending on racial/ethnic group, students in the Great City Schools who take the core curriculum score between 1.4 and 2.4 points higher on the ACT Composite than those who do not take the core curriculum (Figure 3).

Figure 3: Average ACT Composite Scores of Great City Schools Graduates, by Racial/Ethnic Background



Compared with students in the Great City Schools who do not take the core curriculum, average ACT Composite scores of students who take the core curriculum are 1.9 and 1.6 points higher for male and female students, respectively (Figure 4). The graph also shows that, across annual family income ranges, average ACT Composite scores of students in the Great City Schools are at least 1.4 points higher for those who take the core curriculum than for those who do not.

Figure 4: Average ACT Composite Scores of Great City Schools Graduates, by Gender and Income

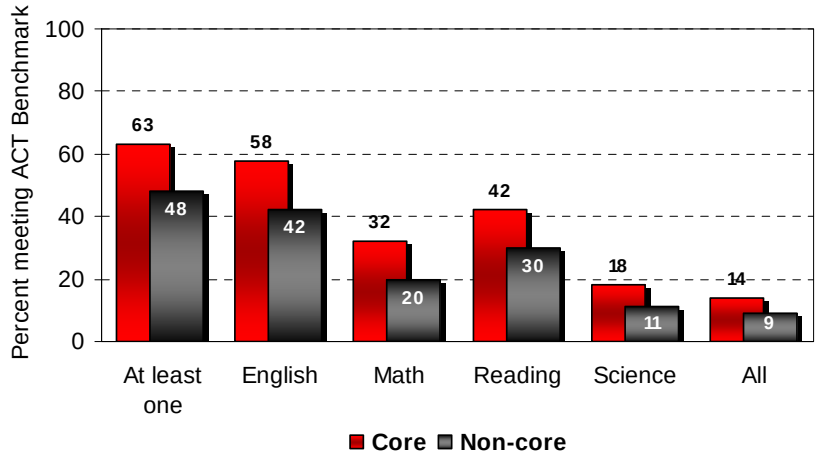


Improved academic achievement for students who take the core curriculum has a positive impact on their readiness for college. The ACT College Readiness Benchmarks represent the level of achievement required for students to have a high probability of success (a 75 percent chance of earning a course grade of C or better, or a 50 percent chance of earning a B or better) in credit-bearing first-year college English Composition, Algebra, introductory social science, and Biology. The Benchmarks correspond to scores on the ACT English, Mathematics, Reading, and Science Tests, respectively.

The ACT College Readiness Benchmarks

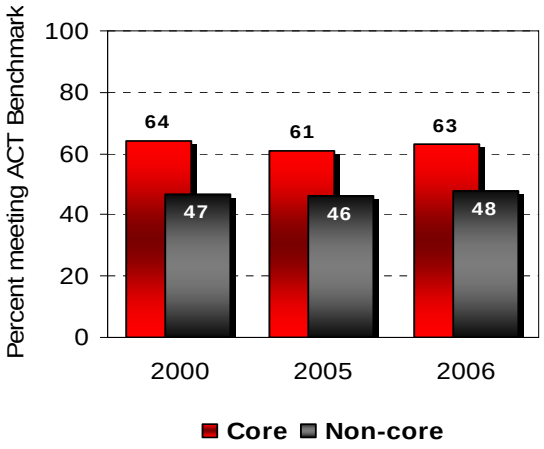
ACT Test	First-Year College Course	ACT College Readiness Benchmark Score
English	College English Composition	18
Mathematics	College Algebra	22
Reading	Introductory college social science	21
Science	College Biology	24

Figure 5: Percentages of ACT-tested Great City Schools Graduates Meeting College Readiness Benchmarks



In 2006, graduates of Great City Schools were more likely to meet the ACT College Readiness Benchmarks if they took the core curriculum in high school (Figure 5). The results for 2000 and 2005 were similar (Figure 6).

Figure 6: Percentages of ACT-tested 2000, 2005, and 2006 Great City School Graduates Meeting at Least One College Readiness Benchmark



The evidence that students taking a core curriculum in high school outperform students who do not is unmistakable for graduates of Great City Schools. Next, we look at the relationship of the core curriculum, and courses taken beyond the core curriculum, with student academic achievement in each subject area.

The Core Curriculum and Beyond

As shown in Table 4 of the Appendix, ACT-tested students in the Great City Schools compare favorably to ACT-tested students nationally in terms of percentages of students taking at least minimum core coursework in mathematics, science, and, especially, English. In 2006, for example, 89 percent of students in the Great City Schools were taking at least four years of English in high school, compared with 73 percent nationally.

Students in the Great City Schools who take all core courses in a subject area earn higher scores on the relevant ACT subject test than do students who take less than the core curriculum in that subject area. And students who take additional courses beyond the core curriculum earn higher scores on the relevant ACT subject test than do students who take only the core curriculum. The higher the level of courses that students take in high school, both nationally and in the Great City Schools, the higher the ACT scores they achieve (see Appendix, Table 5).

Taking core and higher-level courses beyond the core curriculum in a particular subject area is associated with improved college readiness for students in the Great City Schools. The higher the level of courses that students in the Great City Schools take in high school, the more likely these students are to meet the ACT College Readiness Benchmarks.

Figure 7: Percentages of ACT-tested Graduates Meeting ACT English Benchmark, by English Course Sequence

As shown in Figure 7, compared with students in the Great City Schools who take fewer than four years of English, students who take English 9 through English 12 in high school are more likely to meet the ACT College Readiness Benchmark in English (52 percent vs. 46 percent). Taking a speech course in addition to four years of English further increases students' chances of meeting the English Benchmark.

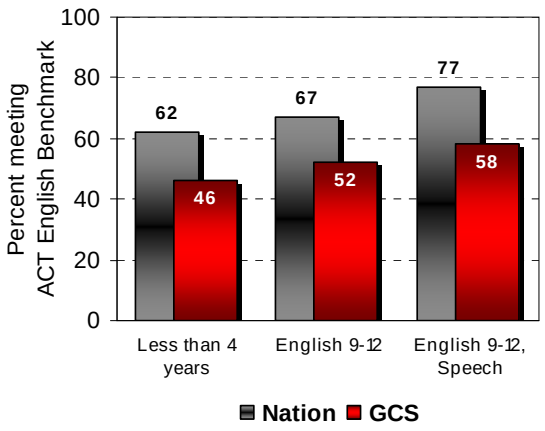


Figure 8: Percentages of ACT-tested Graduates Meeting ACT Mathematics Benchmark, by Mathematics Course Sequence

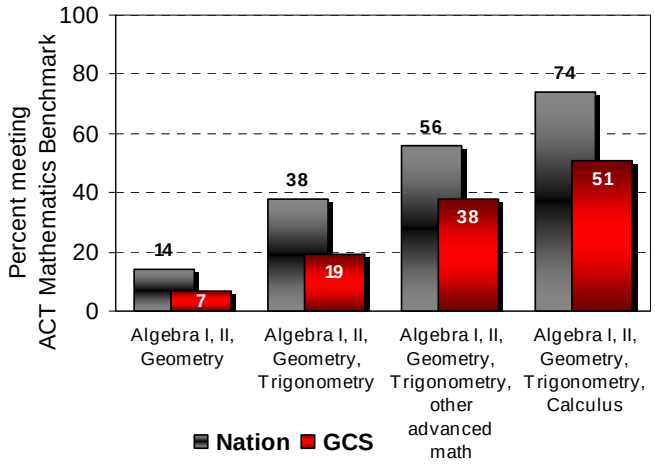
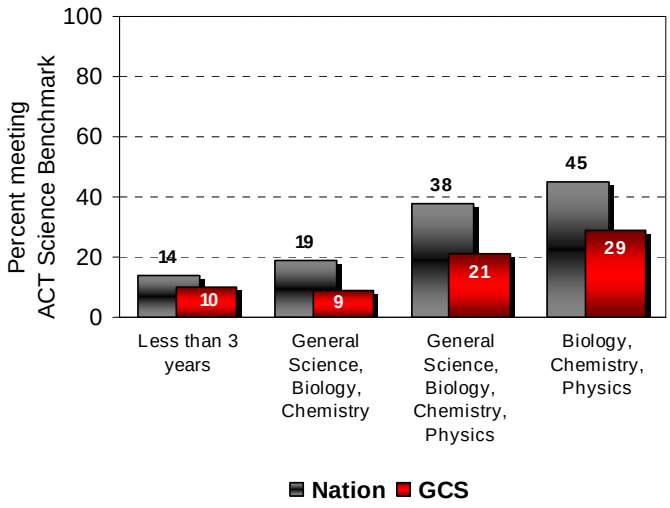


Figure 9: Percentages of ACT-tested Graduates Meeting ACT Science Benchmark, by Science Course Sequence



Compared with students in the Great City Schools who take only Algebra I, Geometry, and Algebra II, students who also take Trigonometry are almost three times more likely to meet the ACT College Readiness Benchmark in Mathematics and students who take both Trigonometry and Calculus are more than seven times more likely to meet the Mathematics Benchmark (Figure 8).

Compared with students in the Great City Schools who take fewer than three years of science in high school, students who take General Science, Biology, Chemistry, and Physics are twice as likely to meet the ACT College Readiness Benchmark in Science (Figure 9).

Thus, for the Great City Schools, students who take a core curriculum outperform students who do not take the core, both in terms of overall achievement and within subject areas. What's more, students in the Great City Schools who take additional higher-level courses beyond the minimum core in a subject area demonstrate greater improvement in their ACT subject test scores than do students who take only the core courses in this subject area.

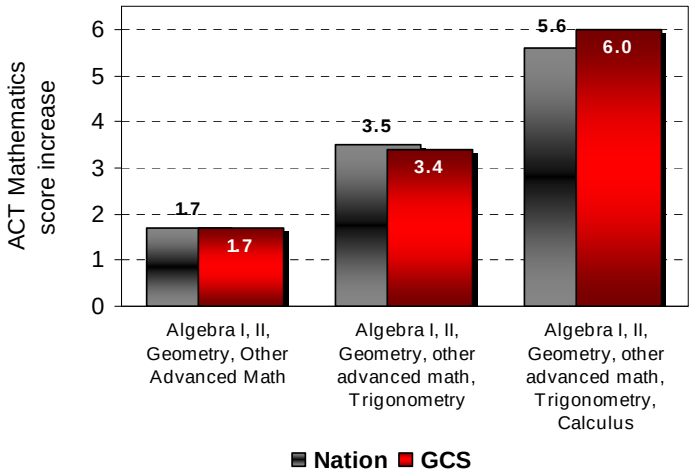
Increased Achievement after Controlling for Prior Academic Performance

It might be argued that students who take higher-level coursework in a subject area show increased achievement on the ACT® test primarily because they are already more likely to be high-achieving students. To test this hypothesis, we conducted an additional analysis to determine whether the value added by additional coursework is dependent on students' prior academic performance—that is, whether only high-performing students take and benefit from taking particular courses. In this analysis, we controlled for student academic performance by using

students' self-reported high school grade point average and grade level. We then looked at the benefits of taking particular courses for students in different ranges of high school grade point averages.

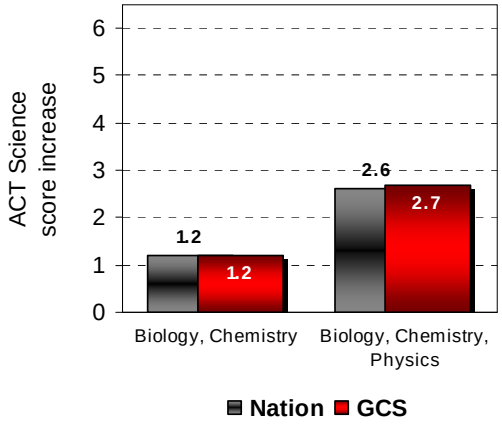
We found that taking higher-level courses was associated with increased achievement for all students, after controlling for their prior academic performance. In mathematics, students in the Great City Schools who take Trigonometry, Calculus, or other higher-level mathematics courses beyond Algebra I, Geometry, and Algebra II score 1.7 points higher on the ACT Mathematics Test than students who take only the three core mathematics courses—after controlling for prior academic performance (Figure 10). Cumulatively, the potential increase in scores for students who take Trigonometry, Calculus, and at least one other higher-level mathematics course beyond the core curriculum is 6.0 points for students in the Great City Schools, compared with 5.6 points for ACT-tested students nationally, after controlling for prior academic performance.

Figure 10: ACT Mathematics Score Increase, Accounting for Prior Achievement



In science, students in the Great City Schools who take Chemistry in addition to Biology score 1.2 points higher on the ACT Science Test than students who take only Biology, again after controlling for prior academic performance (Figure 11). Cumulatively, the potential increase in scores for students who take both Chemistry and Physics in addition to Biology is 2.7 points for students in the Great City Schools, compared with 2.6 points for ACT-tested students nationally, after controlling for prior academic performance. Similar patterns of increases in ACT Mathematics and Science Test score increases are seen for low- and high-achieving students.[5]

Figure 11: ACT Science Score Increase, Accounting for Prior Achievement



These findings suggest that not just higher-achieving students but *all* students could benefit when they take the core curriculum and higher-level courses.

[5] Low- and high-achieving students were identified as those with high school grade point averages of 0.0 to 2.99 and 3.00 to 4.00, respectively.

2

Improvements in College Enrollment and Retention

Students in the Great City Schools who take the ACT-recommended college preparatory core curriculum are more likely to enroll in college, and more likely to return to the same postsecondary institution their second year, than are students who do not take the core curriculum.

Figure 12: College Enrollment Rates for Great City Schools Graduates

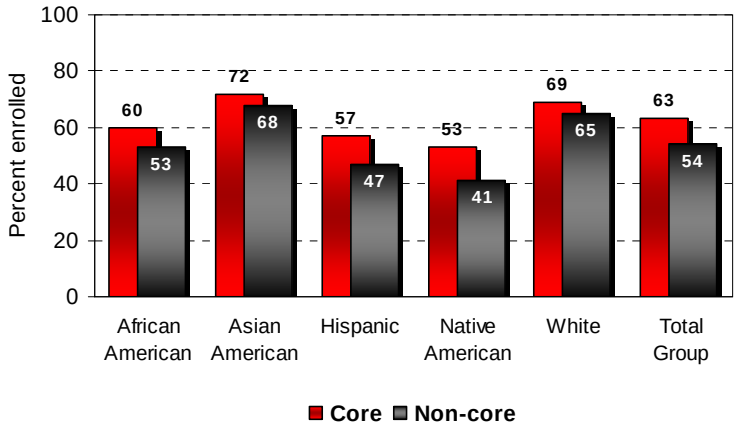
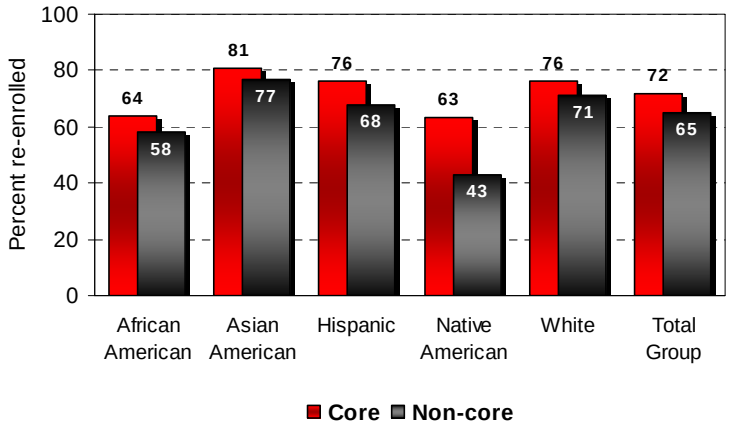


Figure 13: College Retention Rates for Great City Schools Graduates



The goal of improving the college readiness of high school graduates is twofold: to increase the chances that the graduates enroll in college, and to help those who enroll succeed. ACT research shows conclusively that ACT-tested students across the nation who take the core curriculum in high school are enrolling in college at higher rates than are students who do not take the core curriculum. ACT-tested graduates of Great City Schools are no exception.

Figure 12 shows that students in the Great City Schools who take the core curriculum are more likely than those who do not take the core curriculum to enroll in college in the fall following graduation (63 percent vs. 54 percent for the total group).[6]

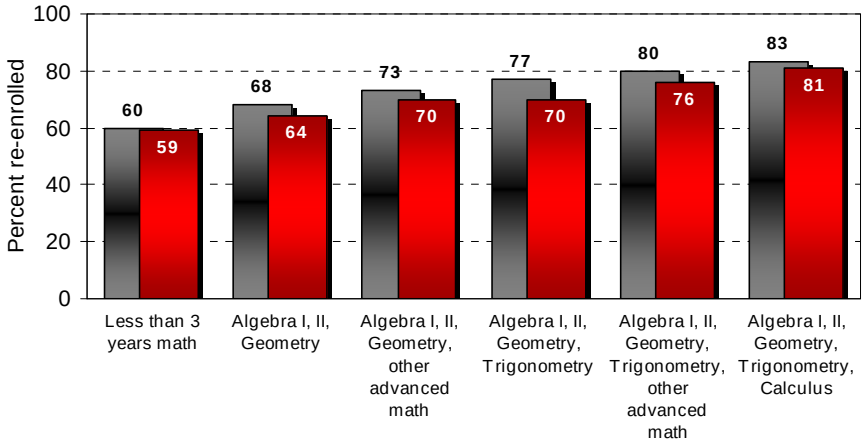
Students in the Great City Schools who take the core curriculum also move on to their second year of college at the same institution at higher rates than do their counterparts who do not take the core curriculum. As shown in Figure 13, students in the Great City Schools who take the core curriculum are more likely than those who do not

[6] Results in this chapter were based on National Student Clearinghouse Data for 2004 ACT-tested high school graduates.

take the core curriculum to re-enroll in the same postsecondary institution their second year (72 percent vs. 65 percent for the total group).

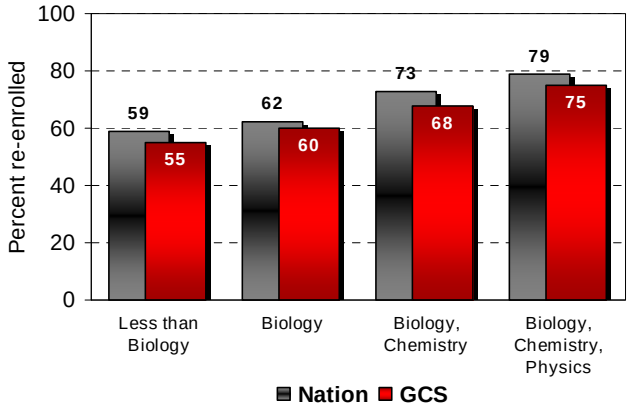
As is true for ACT scores and ACT College Readiness Benchmark attainment, student persistence to their second year of college also improves as students take additional higher-level coursework beyond the minimum core in a subject area. Figure 14 shows that students in the Great City Schools who take at least the three core mathematics courses in high school are more likely than students who take fewer mathematics courses to re-enroll in the same postsecondary institution their second year (64 percent vs. 59 percent). More specifically, students who take Trigonometry and Calculus in addition to core mathematics courses are the most likely to re-enroll in the same postsecondary institution their second year.

Figure 14: College Retention Rates, by Mathematics Course Sequence



As shown in Figure 15, students in the Great City Schools who take Biology and Chemistry in high school are more likely than those who take only Biology to re-enroll in the same postsecondary institution their second year (68 percent vs. 60 percent). Students who take Biology, Chemistry, and Physics are the most likely to re-enroll in the same postsecondary institution their second year.

Figure 15: College Retention Rates, by Science Course Sequence



Therefore, it is clear that graduates of Great City Schools who take a core curriculum and beyond in high school not only improve their academic achievement and college readiness, but also increase their chances of enrolling in college and persisting to their second year of college at the same institution.

3

Recommendations

Urban high schools—and all high schools across the nation—can increase their students' chances of being ready for college by strengthening their core curricula.

In light of the findings presented in the previous chapters and in earlier research, the Council of the Great City Schools and ACT offer the following recommendations for schools to consider, particularly schools with high enrollments of racial/ethnic minorities. These recommendations are intended primarily for teachers and administrators at the school and district levels. However, they may also be of special interest to parents, students, business and community leaders, and policymakers concerned with secondary and postsecondary education:

1. Work hard to increase the extent to which high school students complete a core curriculum. About 40 percent of 2006 ACT-tested high school graduates, both in the Great City Schools and in the nation at large, do not take a core curriculum. Given the clear benefits that taking a core curriculum has on academic performance, readiness for college, college enrollment, and college persistence, all students should be encouraged to take a core curriculum.

2. Specify the number and kinds of courses that students need to take to graduate from high school ready for college and work. In spite of the abundance of evidence showing the benefits of taking a core curriculum in high school, too many students are not taking either the right number or the right kind of courses that they need to be ready for college and work. As it is, many schools are increasing the number of courses that they offer and trying to make sure that their courses are teaching the essential content necessary for college readiness. But schools should also review graduation requirements and, where necessary, revise them to ensure that all students take rigorous core coursework as a prerequisite to high school graduation. At a minimum, these requirements should include:

- four years of English;
- three years of mathematics, including rigorous courses in Algebra I, Geometry, and Algebra II;
- three years of science, including rigorous courses in Biology, Chemistry, and Physics; and
- three years of social studies.

3. Ensure that the high school curriculum provides the foundational skills and knowledge needed for college and work. It is essential for high school course outcomes to be aligned with state standards. A rigorous high school core curriculum must teach students the essential knowledge and skills that they will need to be successful in postsecondary education and work. State standards must also delineate what students ought to know and be able to do in their high school courses in each subject area so that students have a solid foundation on which to begin the next course in the sequence.

A quality high school curriculum is likely to benefit not just those students who are traditionally considered bound for college, but also the majority of high school students who have typically not been the beneficiaries of advanced coursework or other similar efforts to increase college readiness. All high school students should be given a real, equal, and meaningful opportunity to become ready for the challenges of postsecondary education.

4. Strengthen the content of the core courses. In many U.S. high schools, a large gap still exists between the high school curriculum and the requirements of postsecondary institutions. High school core courses need to be strengthened so that *all* students graduate ready for life after high school. Encourage high school students to take a mathematics course every year. Modify college preparatory core courses, where necessary, to include rigorous content or higher-order thinking skills, or to teach the skills needed to enroll in college or participate in training to enter the workforce. Offer a wide range of courses, in particular higher-level courses that increase students' likely success in college courses (e.g., Physics, Calculus, Speech).

5. Keep students reading throughout high school. Consistent with recent ACT research (ACT, 2006b), we also recommend incorporating reading expectations across the curriculum that include, by grade level, increasingly complex reading materials in English, mathematics, science, and social studies. Students must have the opportunity to read complex materials across the curriculum so that they are better positioned to comprehend complex texts in all subjects once they enter college or workforce training.

6. Evaluate the K–8 curriculum. We should not forget that many eighth-graders enter high school without having learned the skills needed to perform well in there. Not only must the high school curriculum be aligned with the requirements of postsecondary education, but the junior high school curriculum must lay the foundation for success in high school. Evaluate the K–8 curriculum to ensure that students are given the foundational skills needed for

college preparatory coursework before they enter high school. For example, Pre-algebra should be offered in junior high school to ensure that all students are ready for Algebra I by grade 9.

Conclusion

There is no question that taking the core curriculum is directly related to college readiness. Improved college readiness leads to a greater chance of success in college and also helps ensure that the workforce of the future is diversified, talented, and ready for the challenges that come with competing in a global economy. College readiness enhances the future opportunities of today's high school graduates and creates new opportunities for them, as well as improves their quality of life. The Council of the Great City Schools and ACT applaud and support the efforts of the nation's urban schools to prepare their students for success in today's fast-paced and technologically complex world. But there is more to be done. Achieving that success will require coordinated work among teachers, administrators, students, parents, and business and community leaders, all of whom must be committed to the goal of ensuring that all high school graduates are prepared for college and workforce training. It is our firm conviction that, with continued effort and with the support of family and community, America's urban schools will fulfill their mission of educating a diverse student body to the highest academic standards and preparing high school graduates to make a difference both in our democracy and the world at large.

Appendix

Council of the Great City Schools Member Districts (2006)

Albuquerque Public Schools
Anchorage School District
Atlanta Public Schools
Austin Independent School District
Baltimore City Public Schools
Birmingham City Schools
Boston Public Schools
Broward County Public Schools
Buffalo City School District
Caddo Parish School District
Charleston County Public Schools
Charlotte-Mecklenburg Schools
Chicago Public Schools
Christina School District
Cincinnati Public Schools
Clark County School District
Cleveland Municipal School District
Columbus Public Schools
Dallas Independent School District
Dayton Public Schools
Denver Public Schools
Des Moines Independent Community School District
Detroit Public Schools
District of Columbia Public Schools
Duval County Public Schools
East Baton Rouge Parish Schools
Fort Worth Independent School District
Fresno Unified School District
Guilford County Schools
Hillsborough County School District
Houston Independent School District
Indianapolis Public Schools
Jackson Public School District
Jefferson County Public Schools
Kansas City Missouri School District
Long Beach Unified School District
Los Angeles Unified School District
Memphis City Public Schools
Metropolitan Nashville Public Schools
Miami-Dade County Public Schools
Milwaukee Public Schools
Minneapolis Public Schools
New Orleans Public Schools
New York City Department of Education
Newark Public Schools
Norfolk Public Schools
Oakland Unified School District
Oklahoma City Public Schools
Omaha Public Schools
Orange County Public Schools
Palm Beach County Public Schools
Philadelphia Public Schools
Pittsburgh Public Schools
Portland Public Schools
Providence Public Schools
Richmond Public Schools
Rochester City School District
Sacramento City Unified School District
Salt Lake City School District
San Diego Unified School District
San Francisco Unified School District
Seattle Public Schools
St. Louis Public Schools
St. Paul Public Schools
Toledo Public Schools
Wichita Public Schools

Table 1: Demographic Information for ACT-tested Graduates

	Great City Schools						Nation	
	2000		2005		2006		2006	
	No. of students	%*	No. of students	%*	No. of students	%*	No. of students	%*
Race/ethnicity								
African American	27,193	39	38,433	40	39,013	40	139,118	13
Asian American	5,238	8	6,293	7	6,490	7	39,867	4
Hispanic	10,375	15	17,348	18	18,074	19	85,796	8
Native American	379	1	537	1	564	1	13,635	1
White	20,110	29	25,233	26	24,684	25	760,084	69
Gender								
Female	43,736	62	61,808	61	61,833	60	646,688	56
Male	26,765	38	39,792	39	41,195	40	517,563	44
Income								
Less than $30,000	28,444	48	36,140	48	36,055	48	223,907	26
$30,000 - $100,000	27,707	47	33,720	45	33,967	45	522,086	60
More than $100, 000	3,161	5	4,994	7	5,344	7	123,853	14
Total ACT-tested†	70,762		102,535		106,737		1,206,455	
12th-grade enrollment‡	339,935		384,417		--		--	
Percent of 12th-graders taking the ACT	21%		27%		--		--	

* Percentages are based on students who report information in the corresponding areas (race/ethnicity, gender, or income).
† The numbers do not add up to the totals because not all students report their demographic information.
‡ Based on NCES data.

Table 2: Average ACT Scores, by Subject Area

	Great City Schools			Nation
ACT test	2000	2005	2006	2006
English				
Core*	19.0	18.8	19.1	21.6
Less than core	16.9	16.8	17.0	19.0
Mathematics				
Core*	19.7	19.3	19.6	21.8
Less than core	17.7	17.7	18.0	19.4
Reading				
Core*	19.8	19.7	20.0	22.3
Less than core	18.0	17.9	18.2	20.1
Science				
Core*	19.6	19.5	19.6	21.7
Less than core	18.1	18.0	18.1	19.7
Composite				
Core*	19.7	19.5	19.7	22.0
Less than core	17.8	17.7	17.9	19.7

* Taking or planning to take core curriculum in all four subject areas.

Table 3: Average ACT Composite Scores, by Race/Ethnicity, Gender, and Income

	Great City Schools			Nation
	2000	2005	2006	2006
Race/ethnicity				
African American				
Core*	17.2	17.1	17.4	17.8
Less than core	15.8	15.9	16.0	16.2
Asian American				
Core*	20.7	20.9	21.5	22.9
Less than core	18.8	19.7	20.0	21.1
Hispanic				
Core*	19.1	18.9	18.8	19.5
Less than core	16.9	17.2	17.3	17.6
Native American				
Core*	20.7	20.2	19.6	20.2
Less than core	19.6	17.2	17.2	17.5
White				
Core*	22.6	22.7	22.9	22.9
Less than core	20.7	21.2	21.4	20.6
Gender				
Female				
Core*	19.6	19.4	19.5	21.8
Less than core	17.7	17.7	17.9	19.7
Male				
Core*	19.8	19.6	19.8	22.3
Less than core	17.9	17.7	17.9	19.7
Income				
Less than $30,000				
Core*	17.8	17.6	17.8	19.4
Less than core	16.4	16.3	16.4	17.5
$30,000 - $100,000				
Core*	20.9	20.5	20.5	22.2
Less than core	19.1	19.0	18.9	20.0
More than $100, 000				
Core*	23.7	23.8	23.8	24.2
Less than core	21.9	21.9	22.2	22.4

* Taking or planning to take core curriculum in all four subject areas.

Table 4: Percentages of Students Taking Specific Course Sequences

Course Sequence	Great City Schools						Nation	
	2000		2005		2006		2006	
	No. of students	%*	No. of students	%*	No. of students	%*	No. of students	%*
English								
Less than 4 years of English	3,873	6	8,317	9	10,285	11	272,554	26
English 9-12	51,358	76	65,054	72	68,585	75	668,226	63
English 9-12, Speech	12,742	19	16,941	19	12,902	14	115,551	10
Mathematics								
Less than 3 years of math	6,802	10	9,381	10	10,426	11	131,567	13
Algebra I, II, Geometry	15,721	23	19,712	22	20,221	22	209,836	20
Algebra I, II, Geometry, Other Advanced Math	7,117	10	13,181	15	13,564	15	153,394	15
Algebra I, II, Geometry, Trigonometry	7,597	11	9,848	11	9,919	11	95,613	9
Algebra I, II, Geometry, Trigonometry, Other Advanced Math	5,413	8	6,309	7	6,305	7	90,348	9
Algebra I, II, Geometry, Trigonometry, Calculus	4,456	7	5,430	6	5,408	6	67,960	6
Natural Science								
Less than 3 years of science	12,156	18	15,087	17	15,673	17	234,307	22
General Science, Biology, Chemistry	20,730	31	30,962	35	31,954	35	339,689	33
General Science, Biology, Chemistry, Physics	20,904	31	28,286	32	28,482	32	320,821	31
Biology, Chemistry, Physics	12,095	18	11,795	13	11,078	12	115,519	11
Core in English, Math, Social Studies, & Science								
Core	42,833	63	56,210	62	56,786	61	647,298	61
Less than core	25,249	37	34,458	38	35,576	39	413,888	39

* Percentages represent the percentages of students taking specific course sequences relative to students who reported their course taking information in the corresponding subject area (English, mathematics, or science).

Table 5: Average ACT Test Scores for Students Taking Specific Course Sequences

Course Sequence	Great City Schools			Nation
	2000	2005	2006	2006
English				
Less than 4 years of English	16.5	16.8	17.3	19.4
English 9-12	18.3	18.2	18.2	20.4
English 9-12, Speech	18.2	18.0	19.1	21.8
Mathematics				
Less than 3 years of math	16.2	17.1	17.5	17.9
Algebra I, II, Geometry	16.3	16.3	16.5	17.8
Algebra I, II, Geometry, Other Advanced Math	18.7	18.5	18.8	20.3
Algebra I, II, Geometry, Trigonometry	18.4	17.6	17.9	20.4
Algebra I, II, Geometry, Trigonometry, Other Advanced Math	20.7	20.1	20.3	22.2
Algebra I, II, Geometry, Trigonometry, Calculus	22.5	21.7	21.9	24.7
Natural Science				
Less than 3 years of science	17.6	17.8	17.8	19.1
General Science, Biology, Chemistry	17.9	18.0	18.1	20.2
General Science, Biology, Chemistry, Physics	20.0	19.8	19.9	22.3
Biology, Chemistry, Physics	20.8	21.0	21.1	23.2

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