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CHARTER SCHOOL ACHIEVEMENT ON THE 2005 NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

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Authors' Note

The following AFT report is the only comprehensive report available to the public that uses the 2005 National Assessment of Educational Progress (NAEP) to compare student achievement in charter schools with achievement in other public schools. In our report, NAEP results are reported exactly as they would be in an official NAEP report, including all data qualifications used by NAEP regarding statistical significance and data reporting standards.

In addition to the 2005 NAEP student achievement results, our report also includes 2003 NAEP findings. In one area, our 2003 results appear to differ from a recently released, federally funded study by Sarah and Chris Lubienski at the University of Illinois, which analyzed public, private and charter school student achievement using the 2003 NAEP math scores.¹ For eighth-grade math in 2003, our study reports a five scale score point advantage for public schools, but it was not statistically significant. The Lubienski study found a 0.5 scale score point advantage for charter school eighth-graders over public school eighth-graders, which grew to a 2.4 scale score point advantage after controlling for demographics and location, although neither difference was statistically significant. Our results appear to differ because the Lubienski study weights each school equally and small charter schools scored higher; when the results are reported for *students* rather than *schools*, as we do, public schools have the same five-point advantage reported in our report (Table 1 below).

Another analysis reported some findings identical to those in our study, but in a selective manner. The National Alliance for Public Charter Schools, using the NAEP Data Explorer (the same data source used in our report), presented only a few comparisons between charter and other public schools.² The conclusions they drew are not consistent with NAEP reporting standards. According to the Alliance:

Fourth graders attending charter schools are making notable strides in math and particularly in reading. African-American, Latino, and low-income charter students registered larger reading gains than their fourth-grade peers in non-charter public schools.

As our study shows, charter school students in 2005, on average, scored the same or lower in almost every comparison with public school students. Math scores for both charter and other public schools rose from 2003 to 2005 by approximately the same amount. In reading, the increase in average charter school scores between 2003 and 2005 was larger than the public school increase over the same period, but the average charter school score was lower than in other public schools. It is important to note that “gains” or “increases” do not refer to the progress of individual schools or students. One sample of schools and students in 2005 is compared to another sample of schools and students in 2003. Consequently, the statistical significance is crucial in determining real change. The change in charter school scores overall, for low-income students in math and for racial/ethnic groups in both subjects, are not statistically significant.³ The change in reading from 2003 to 2005 for low-income students is the only statistically

¹ Christopher and Sarah Theule Lubienski, *Charter, Private, Public Schools and Academic Achievement: New Evidence from NAEP Mathematics Data* (Champaign-Urbana: University of Illinois, 2005). Available at http://www.ncspe.org/publications_files/OP111.pdf.

² “New York Times Article Provides Incomplete Picture of Academic Achievement in Public Charter Schools,” statement by Nelson Smith, President, National Alliance for Public Charter Schools. Available at <http://www.publiccharters.org/pdf/statement12806.pdf>.

³ Unlike in 2003, there were some statistically significant racial/ethnic differences in 2005. In grade 8 math, black students in charter schools had lower average scale scores than their peers in other public schools, and the six-point difference was statistically significant. Charter school data for Hispanic fourth-graders in math and eighth-graders in both subjects did not meet the NAEP reporting standard. In the one subject and grade with reportable data, Hispanic fourth-graders in charter schools scored 10 points higher in reading than Hispanic students in other public schools, and the difference was statistically significant. However, the 10-point reading difference between the scale score of 201 in 2003 and the score of 211 two years later is not a statistically significant change. These findings on statistical

significant change for charter schools. On the other hand, even small changes between 2003 and 2005 for other public schools and their subgroups are statistically significant due to a very large sample size.

The findings of different studies using the same data should yield similar results. This note identifies the commonality between findings in our study and in other studies of the same data.

significance appear contradictory, but the small number of Hispanic charter school students in 2003 and 2005 (so small that comparisons with other grade/subject Hispanic results are not reportable) yield imprecisely estimated average scores (one for 2003 and one for 2005). Consequently, the difference between 2003 and 2005 is also imprecise and subject to statistical error. On the other hand, public school findings are very precise due to a large sample of Hispanic students. As a result, the comparison between public school and charter school students in 2005 (although still an imprecise estimate for charter schools) is much more precise and much more likely to show statistical significance than when comparing charter schools in two different years.

Charter School Achievement on the 2005 National Assessment of Educational Progress

Executive Summary

The 2003 administration of the National Assessment of Educational Progress (NAEP) in math and reading in grades 4 and 8 represented the first time that a nationally representative sample of charter schools (grade 4) was included in NAEP. The 2005 NAEP included a larger sample of charter school students, allowing for a statistically reliable analysis of the eighth grade as well.

Overall Achievement Differences

- **Average Scores.** Compared to students in other public schools, charter school students had lower achievement in grade 4 math (five scale points lower) but they scored the same as students in other public schools in reading. In grade 8, charter school students scored 10 points lower in math and five points lower in reading, and these differences were statistically significant. Since 10 scale score points represent about one full year of learning, the differences between charter and other public schools are substantial.
- **Achievement Levels.** In fourth- and eighth-grade math and in eighth-grade reading, the percentages of charter school students performing at or above *Basic* and at or above *Proficient* were lower than the corresponding percentages for other public school students. These differences were statistically significant.

Free or Reduced-Price Lunch Eligibility. Charter schools are somewhat more likely than other public schools to enroll students eligible for free or reduced-price lunch, a frequently used proxy for family economic background. In grade 4, about half of charter school students are eligible compared with 46 percent in other public schools. In grade 8, 53 percent of charter school students are eligible compared with 40 percent in other public schools.

- **Achievement of Students Eligible for Free or Reduced-Price Lunch.** Among students eligible for free and reduced-price lunch, in grade 4, there was no difference in reading scores between students attending charter and other public schools. Students in grade 4 at other public schools scored three points higher than charter school students in math, a statistically insignificant differential. In grade 8, average scores were lower in charter schools than in other public schools in both reading and math for students eligible for free and reduced-price lunch. Charter school students lagged behind other public school students by seven scale score points in math and four points in reading. The only statistically significant difference reported was in grade 8 math, where charter school students not eligible for free and reduced-lunch scored 11 scale score points below not eligible students in other public schools.
- **Achievement Gap.** In both charter and other public schools, the achievement gap between students who were eligible and not eligible for free or reduced-price lunch was substantial in both subjects and both grades. Depending on the subject and grade, the achievement gap in charter schools varied from 19 to 23 points compared with 23 to 27 points in other public schools.

Central-City Location. Charter school operators often locate in or near central cities. Because student achievement generally is lower in central cities, it is important to ask whether the lower student achievement in charter schools reflects the charter schools' urban location. On the other hand, there is some evidence that charter school students in central city are slightly less likely to be eligible for free or reduced-price lunch than students in other public schools.

- **Fourth-Grade Average Scores.** In 2005, in central cities, the scale score difference was four points in math (not statistically significant) and scores were identical in reading.
- **Eighth-Grade Average Scores.** In 2005, in central cities, the scale score difference was three points in math (not statistically significant) and the reading scores were the same for students in charter schools and other public schools.

Minority Students. Charter schools report a higher percentage of black students enrolled (35 percent, grade 4) compared with other public schools (17 percent, grade 4), but that is not surprising given that charter schools are more likely to operate in central cities. However, charter schools are no more likely than other public schools to enroll Hispanic students, and charter schools located in central cities are half as likely as other central city public schools to enroll Hispanic students. Because average student achievement of black and Hispanic students generally is lower than for white students, it is important to ask whether charters' disproportionate enrollment of black (but not Hispanic) students explains the lower achievement of charter schools relative to other public schools. The NAEP results suggest it does not.

- **Fourth-Grade Average Scores.** In 2005, black fourth-graders in charter schools scored four points lower in math than black fourth-graders in other public schools and two points lower in reading. Neither difference was statistically significant. Hispanic math performance in charter schools was not reported because the data did not meet NAEP reporting standards. Hispanic fourth-graders in charter schools scored 10 points higher in reading than Hispanic students in other public schools, and the difference was statistically significant. The 10 point reading difference between the scale score of 201 in 2003 and the score of 211 two years later is not a statistically significant change. Furthermore, Hispanic charter school students were half as likely to go to a central-city school as Hispanic students in other public schools.
- **Eighth-Grade Average Scores.** In math, black students in charter schools had lower average scale scores than their peers in other public schools, and the six point difference for black students was statistically significant. In reading, black students scored three points lower, a statistically insignificant difference. Data for Hispanic eighth-graders in charter schools did not meet NAEP reporting standards in either subject.
- **Achievement Gaps.** The black-white achievement gaps in grades 4 and 8 math and reading are nearly the same in charter schools as in other public schools. The evidence thus far from NAEP suggests that charter schools are not more successful at reducing black-white achievement disparities than are other public schools.

Background

The National Assessment of Educational Progress (NAEP), often termed “the nation’s report card,” has been testing the academic achievement of a nationally representative sample of students and publicly reporting the results since 1969. NAEP is a project of the National Center for Education Statistics (NCES), which is within the Institute of Education Sciences (IES) of the U.S. Department of Education. Overall policy direction for NAEP is the responsibility of the National Assessment Governing Board (NAGB), an independent entity whose members are appointed by the U.S. secretary of education according to criteria set by Congress.

In 2003, NAEP conducted national and state assessments in reading and mathematics in grades 4 and 8 and, for the first time, completed a nationally representative sample of charter schools (grade 4). Those schools also received a special NAEP Charter School Survey Questionnaire asking for information on mission and governance. Grade 8 charter schools were also included in 2003 NAEP, but these schools, unlike the grade 4 sample, were not specially drawn to be nationally representative. The 2005 administration of NAEP included a larger sample of charter school students (increasing from 1.3 percent in the fourth grade to more than 2 percent), which enabled a statistically reliable analysis of the eighth grade. The 2003 charter school data collection involved oversampling to get enough charter school students to ensure a reliable analysis, but there was no oversampling in 2005.

The 2003 NAEP results were released on Nov. 13, 2003, but the charter school results were not among them. NAGB had planned instead to produce a separate NAEP Charter School Report, which NCES originally scheduled for release in January 2004. This “official” NAEP charter school report was repeatedly delayed and eventually released in December 2004, several months after the release of the AFT report on NAEP charter school outcomes.¹

Frustrated by the repeated delays in the release of the NAEP Charter School Report and knowing that the data were collected in 2003, the American Federation of Teachers (AFT) decided to try to unearth the basic NAEP charter school results. Embedded in the questionnaire that was administered to schools along with the 2003 NAEP is the question: “What type of school is this?” “Charter school” was one of the possible answers. This enabled the AFT to comb through the Web-based NAEP Data Tool to identify NAEP’s first-time, nationally representative sample of charter schools (grade 4).

Our reporting of the 2003 NAEP charter school data generated extensive media coverage and a sharp attack by charter school advocates who signed an advertisement titled: “[AFT] Charter School Evaluation Reported by *The New York Times* Fails to Meet Professional Standards” (*Education Week* 9/15/04). The ad called for, among other things, professional review, better family background data, data on student achievement growth and more sophisticated analyses. The debate ensued for months, much of it summarized in *The Charter School Dust-Up*.² According to book authors Carnoy, Jacobsen, Mishel and Rothstein, their review of charter school student achievement studies indicated that the NAEP findings are consistent with several state-level comparative studies of academic achievement in charter and other public schools. The state-level studies suggest that charter schools do not perform better than other public schools even when growth in student achievement is the outcome measure or when charter schools have had time to mature and shake off early problems.

¹ F. Howard Nelson, Bella Rosenberg and Nancy Van Meter, *Charter School Achievement on the 2003 National Assessment of Educational Progress* (Washington, D.C.: American Federation of Teachers, 2004). <http://www.aft.org/pubs-reports/downloads/teachers/NAEPCharterSchoolReport.pdf>.

² Martin Carnoy et al., *The Charter School Dust-Up: Examining the Evidence on Enrollment and Achievement* (Washington D.C.: Economic Policy Institute, 2005).

The 2003 data in this report differ slightly from the 2003 data in the AFT's August 2004 NAEP charter school report due to revisions to the charter school sample made by NCES in fall 2004. The revisions resulted in a charter school sample that was far less urban (it had been about 60 percent urban for fourth-grade students and it changed to about 50 percent urban). The revised sample also had a lower percentage of charter school students eligible for free and reduced-price lunch.

Whereas official NAEP reports have always contained only descriptive data, NCES had proposed accompanying the charter school results with a special analysis, using hierarchical linear modeling (HLM),³ that “would try to determine whether the characteristics of charter schools, such as their governance, can explain any achievement differences from other public schools beyond those accounted for by the characteristics of their students.”⁴ Contracted to the Educational Testing Service, and originally expected to be released with the descriptive analysis (finally issued in December 2004), the HLM study of 2003 charter school data currently is slated for release early in the spring of 2006, several months after the 2005 NAEP data for charter schools was released.

Using the NAEP Data Tool, our 2003 report separated charter schools from other public schools and compared student achievement in math and reading in grades 4 and 8. To enhance the fairness of the analysis, additional comparisons of charter schools and other public schools were conducted for several student subgroups:

- Eligibility for the federal free and reduced-price school lunch program;
- School location (central cities, urban fringe/large towns, and rural/small towns); and
- Race/ethnicity (from school records, as is typically reported by NAEP).

Unfortunately, the NAEP Data Tool only permitted a comparison between charter schools and other public schools by the specific factors presented in our study and not by the dozens of other student, school and community background characteristics that NAEP gleans. Released at the same time as the 2005 results, the more sophisticated NAEP Data Explorer offers more computation options, some of which are incorporated into our 2005 report. The NAEP Data Tool did not contain the detailed Charter School Survey Questionnaire that was expressly developed for the NAEP charter school report, so its results could not be analyzed. Similarly, the 2005 charter school questionnaire is not on the NAEP Data Explorer.

³ The following description of HLM is abstracted from Anthony S. Bryk and Stephen W. Raudenbush, *Hierarchical Linear Models for Social and Behavioural Research: Applications and Data Analysis Methods* (Newbury Park, Calif.: Sage Publications, 1991). The basic idea of HLM is to think of the lowest-level units (smallest and most numerous) as organized into a hierarchy of successively higher-level units. For example, students are in classes, classes are in schools, schools are in school districts, school districts are in the states. We can then describe outcomes for an individual student as a sum of effects for the individual student, for her/his class, for the school, for the district and for the state. Hierarchical models are often applicable to modeling of data from complex surveys, because usually a clustered or multistage sample design is used when the population has a hierarchical structure in the sense described above. For more details, see <http://www.fas.harvard.edu/~stats/survey-soft/hierarchical.html>.

⁴ Report of May 14, 2004, NAGB Reporting and Dissemination Committee; also see April 30, 2004, NCES memo, “Plans for Reporting Private School and Charter School Results.”

How Well Did Charter School Students Perform in 2003 and 2005 In Comparison to Students in Other Public Schools?

Average Score. The 2005 NAEP scores from charter and other public school students show that charter school students continue to lag behind other public school students in most match-ups, as they did in 2003. Table 1 shows that in 2005, charter school students had lower student achievement than students in other public schools, at statistically significant levels, in fourth-grade math (by five points) and eighth-grade math and reading (10 points lower in math and five points lower in reading).

Table 1. Average mathematics and reading scale scores and achievement level, grades 4 and 8: 2003 and 2005

		Percent of Pupils	Average Scale Score	At or Above Basic
Grade 4 Math				
2003	Charter	1.3%	228 *	69% *
	Other Public		234	76%
2005	Charter	2.0% -2.5%	232 *	74% *
	Other Public		237	80%
Grade 4 Reading				
2003	Charter	1.3%	212	58%
	Other Public		217	62%
2005	Charter	2.0% -2.5%	216	60%
	Other Public		217	63%
Grade 8 Math				
2003	Charter	0.9%	271	58% *
	Other Public		276	67%
2005	Charter	1.0% -1.5%	268 *	56% *
	Other Public		278	68%
Grade 8 Reading				
2003	Charter	0.9%	259	67%
	Other Public		261	72%
2005	Charter	1.0% -1.5%	255 *	65% *
	Other Public		260	71%

*Significantly different from other public schools at the 0.05 level. None of the charter school changes from 2003 to 2005 are statistically significant, while all changes in other public schools are statistically significant.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

In 2003, charter school students had lower student achievement, measured by scale scores, in both fourth grade (six points lower in math and five points lower in reading) and eighth grade (five points lower in math and two points lower in reading). The differences were statistically significant only in grade 4 math and grade 8 math at the above-Basic achievement level, but not in reading in either grade.⁵ However, the grade 4 reading differential also was statistically significant for students without disabilities.⁶

⁵ All differences reported are significant at the 0.05 level with appropriate adjustments for multiple comparisons. Statistical tests are conducted to determine whether the changes or differences between two result numbers are statistically significant. The term “significant” does not imply a judgment about the absolute magnitude or educational relevance of changes in student performance. Rather, it is used to indicate that the observed differences

NAEP scale scores are common across age or grade levels and assessment years used to report NAEP results; they are expressed on a 0-500 scale for reading and mathematics.⁷ Over the four years from grade 4 to grade 8 in the 2003 national public school sample, average math scale scores progress from 234 to 276, or 10.5 points a year. In reading, scale scores progress from 217 to 261, or 11 points a year. Therefore, the achievement difference in 2005 between charter school and other public school students in fourth-grade math can be said to have been about one-half a year of school, and in eighth-grade math, a full year.

Although math and reading scores for charter school fourth-graders were higher in 2005 than in 2003, the changes are not statistically significant (the observed differences possibly are associated with sampling and measurement error, and are not statistically dependable population differences). Grade 8 math and reading scores are lower in 2005 than 2003, but the NAEP Data Explorer does not calculate the statistical significance of charter school differences between 2003 and 2005. Changes in student achievement between 2003 and 2005 in other public schools in Table 1 are statistically significant, due in part to the much larger sample size, 50 or 100 times larger than the charter school sample.

Achievement-Level Results. Table 2 shows the percentages of students in charter schools and other public schools performing below *Basic*, at or above *Basic*, at or above *Proficient* and at *Advanced* levels for grades 4 and 8.⁸ Achievement-level percentages are values that indicate the percentage of students within the total population, or in a particular subgroup, who meet or exceed expectations of what students should know and be able to do.⁹ Specifically, they are the weighted percentage of students with NAEP composite scores that are equal to, or exceed, NAGB's achievement-level cut scores. (See Technical Appendix for a more complete definition of the four proficiency levels.)

are not likely to be associated with sampling and measurement error, but are statistically dependable population differences.

⁶ Students without disabilities scored 215 in grade 4 reading in charter schools and 220 in other public schools.

⁷ Scaling is the process of assigning numbers to reflect students' performance on an assessment. The scale score is derived from the overall level of performance of groups of students on NAEP assessment items. In NAEP, scaling is based on item response theory (IRT) and results in a scale score for each subject area that can be used to summarize levels of performance attained by particular groups of students.

⁸ 2003 grade 8 charter school data were on the NAEP Data Tool but are no longer available on the NAEP Data Explorer.

⁹ To quote the language typically used in NAEP reports, "As provided by law, NCES, upon review of a congressionally mandated evaluation of NAEP, has determined that achievement levels are to be used on a trial basis and should be interpreted and used with caution. However, both NCES and NAGB believe that these performance standards are useful for understanding trends in student achievement. NAEP achievement levels have been widely used by national and state officials." The "trial" use of NAGB's achievement levels has been ongoing since 1992, despite a number of highly critical evaluations of the validity of the levels, which include evidence that the standards they reflect for what students *should* know are quite high. See, for example, U.S. General Accounting Office, *Educational Achievement Standards: NAGB's Approach Yields Misleading Interpretations: Report to Congressional Requesters* (Washington, D.C.: GAO, 1993); National Academy of Education Panel on the Evaluation of the NAEP Trial State Assessment, *An Evaluation of the 1992 Achievement Levels* (Stanford, Calif.: National Academy of Education, 1993); and James W. Pellegrino, Lee R. Jones and Karen J. Mitchell, eds., *Grading the Nation's Report Card: Evaluating NAEP and Transforming the Assessment of Educational Progress* (Washington, D.C.: National Academy Press, 1999).

Table 2. Average mathematics and reading scale scores, grades 4 and 8: 2003 and 2005

		Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Grade 4 Math					
2003	Charter	31% *	69% *	25% *	3%
	Other Public	24%	76%	31%	4%
2005	Charter	26% *	74% *	29% *	3%
	Other Public	20%	80%	35%	5%
Grade 4 Reading					
2003	Charter	42%	58%	27%	5%
	Other Public	38%	62%	30%	7%
2005	Charter	40%	60%	28%	6%
	Other Public	37%	63%	30%	7%
Grade 8 Math					
2003	Charter	42% *	58% *	24%	6%
	Other Public	33%	67%	27%	5%
2005	Charter	44% *	56% *	21% *	4%
	Other Public	32%	68%	29%	6%
Grade 8 Reading					
2003	Charter	33%	67%	29%	4%
	Other Public	28%	72%	30%	3%
2005	Charter	35% *	65% *	24% *	2%
	Other Public	29%	71%	29%	3%

*Significantly different from other public schools at the 0.05 level. None of the charter school changes from 2003 to 2005 are statistically significant, while all changes in other public schools are statistically significant.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

In 2003, at grades 4 and 8 in both subjects, the percentages of students in charter schools performing at or above *Basic* and at or above *Proficient* were lower than the corresponding percentages in other public schools. In 2003, for example, 69 percent of charter school students scored at the *Basic* level or higher in grade 4 math, while the comparable figure for students in other public schools was 76 percent. The lower achievement of charter schools at the *Basic* level was statistically significant for grade 4 and grade 8 math. At the *Proficient* level, the lower achievement of charter schools was statistically significant in grade 4 math.

In 2005, in grade 4 math and grade 8 math and reading, charter schools had a higher percentage of students below *Basic*, and a lower percentage of students at or above *Basic*. These differences were statistically significant.

Although math and reading achievement levels for charter schools were higher in 2005 than in 2003, the changes were not statistically significant (the observed differences possibly are associated with sampling and measurement error, and are not statistically dependable population differences). All changes in other public schools between 2003 and 2005 in Table 2 are statistically significant, partly because the number of students in the sample was 50 or 100 times larger than the charter school sample.

How Various Groups of Students in Charter Schools Performed in Comparison to Similar Students in Other Public Schools

In addition to reporting on students' overall performance on its assessments, NAEP also reports on the performance of various subgroups of students. In each of the three major subgroup comparisons (free-lunch eligibility, urban location and race/ethnic group), charter school students performed no better and usually worse than students in other public schools. However, especially in 2005, the differences usually were not statistically significant, even when the differences amounted to half a year of learning. The exceptions were fourth-grade reading for Hispanic students (favoring charter schools) and eighth-grade math for black students (favoring other public schools).

We caution, as NAEP does in its reports: "When reading these subgroup results, it is important to keep in mind that there is no simple, cause-and-effect relationship between membership in a subgroup and achievement in NAEP. A complex mix of educational and socioeconomic factors may interact to affect student performance."

Students Eligible for Free/Reduced-Price School Lunch

NAEP collects data on students' eligibility for free/reduced-price lunch as an indicator of family economic status. Eligibility for free and reduced-price lunches is determined by students' family income in relation to the federally established poverty level. Free-lunch qualification is set at 130 percent of the poverty level, and reduced-price lunch qualification is set at between 130 percent and 185 percent of the poverty level. Information regarding students' charter school eligibility in 2003 was not available for 10 percent of fourth-graders and 11 percent of eighth-graders, either because their schools did not participate in the National School Lunch Program or for other reasons.¹⁰ Charter schools with few students eligible for the free/reduced-price lunch program often do not participate, partly due to high administrative costs, but it is also a practice thought to discourage the enrollment of students from low-income families. Following NAEP reporting conventions, nonreporting schools are omitted from our analysis.

The information on eligibility for free/reduced-price lunch in Table 3 suggests that charter schools are slightly more likely to enroll poor children (50 percent of fourth-graders) than other public schools (46 percent), but the difference is not statistically significant. To make the comparison of charter and other public schools fairer, we therefore compare students from families of similar economic status.¹¹

¹⁰ In 2005, information was not available for 10 percent of charter school fourth-graders (and for 2 percent in other public schools) and 15 percent of charter school eighth-graders (and for 3 percent in other public schools).

¹¹ We have repeatedly, but unsuccessfully, urged NAEP to compare students with similar backgrounds as part of its public reporting of public/private school comparisons. The differences in students between these two sectors are far greater than those between charter and other public school students.

Table 3. Average mathematics and reading scale scores by eligibility for free/reduced-price school lunch, grade 4, 2003 and 2005

		Charter Schools			Other Public Schools		
		Weighted Percentage of Students	Average Scale Score	At or Above Basic	Weighted Percentage of Students	Average Scale Score	At or Above Basic
Grade 4 Math							
2003	Eligible	47%	216 *	53%	46%	222	62%
	Not Eligible	53%	238	81%	54%	244	88%
2005	Eligible	50%	222	62%	46%	225	67%
	Not Eligible	50%	241	84%	54%	248	90%
Grade 4 Reading							
2003	Eligible	45%	195 *	39%	46%	201	45%
	Not Eligible	55%	226	72%	54%	229	76%
2005	Eligible	51%	203	46%	46%	203	46%
	Not Eligible	49%	226	73%	54%	230	77%

*Significantly different from other public schools at the 0.05 level. The charter school change in reading (but not math) from 2003 to 2005 is statistically significant, while all changes in other public schools are statistically significant.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

Fourth-Grade Average Scores. Average scores in 2003 were higher in other public schools than in charter schools in each subject, both for students who were eligible and not eligible for free/reduced-price lunch. Among students eligible for the lunch program, the difference was nearly six scale score points in grade 4 math and six points in reading—both statistically significant differences. These scale score differences translate into a little more than half a year of schooling. In 2005, there was no difference in reading and a three point higher score for other public school students in math, a statistically insignificant differential. The charter school change in reading (but not math) from 2003 to 2005 is statistically significant, while all changes in other public schools are statistically significant. Due to a very large sample, almost all changes for other public school students are statistically significant.

Table 4. Average mathematics and reading scale scores by eligibility for free/reduced-price school lunch, grade 8, 2005

		Charter Schools			Other Public Schools		
		Weighted Percentage of Students	Average Scale Score	At or Above Basic	Weighted Percentage of Students	Average Scale Score	At or Above Basic
Grade 8 Math							
2005	Eligible	53%	255	43%	40%	262	51%
	Not Eligible	47%	277 *	67% *	60%	288	79%
Grade 8 Reading							
2005	Eligible	53%	243	52%	40%	247	57%
	Not Eligible	47%	265	74%	60%	270	81%

*Significantly different from other public schools at the 0.05 level.

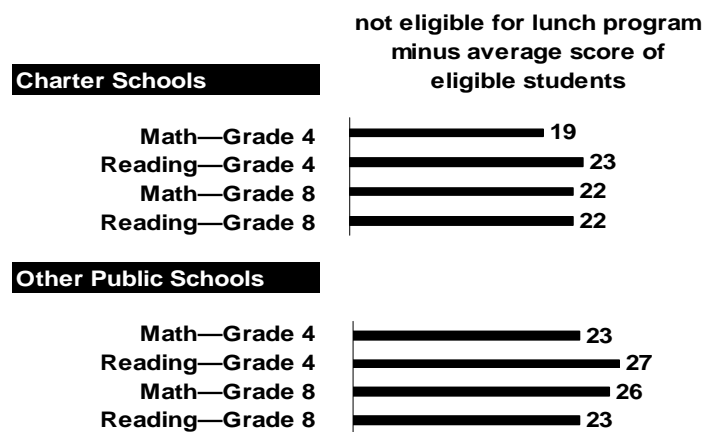
NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

Eighth-Grade Average Scores. Average scores in 2005 were higher in other public schools than in charter schools in each subject, both for students who were eligible and not eligible for free/reduced-price

lunch (Table 4). For students eligible for the lunch program, the difference was nearly seven scale score points in math and four points in reading—both large but not statistically significant differences. The scale score difference in math translates into a little more than half a year of schooling. Charter school students who are not eligible for free and reduced-price lunch scored five points lower in reading and 11 points lower in math than other public schools, and the difference in math was statistically significant.

Figure 1



Achievement Gap. As in other public schools, the average mathematics and reading scores in both grades 4 and 8 for students in charter schools who were eligible for free/reduced-price lunch were much lower than the average score for students who were not eligible (Figure 1). In charter schools, the gap was slightly less than in other public schools in each grade and subject. In 2003, charter school achievement gaps were similar to other public schools. The charter school achievement gap closed because eligible students scored higher in 2005 while ineligible students did not have higher scores in the 2005 sample.

Location of School

Charter school operators often locate in or near central cities, where public schools may be struggling and parents are more likely to seek education alternatives for their youngsters. Moreover, the population density in urban areas may reduce student transportation problems for charter schools and offer more opportunities to find larger facilities. Data from the NCES Schools and Staffing Survey (SASS) show that 47.3 percent of charter school *teachers* worked in central cities, compared to only 26.9 percent of other public school teachers.¹²

Because student achievement generally is lower in central cities, it is possible that lower student achievement in charter schools may only reflect the greater likelihood of charter school location in central cities. If so, then it may still be possible that charter schools outperform other central-city public schools. Certainly that is an assumption underlying the federal NCLB legislation, which lists being restructured as a charter school as one of the sanctions for public schools that persistently fail to make “adequate yearly progress” as called for in the law.

NAEP classifies the type of community where a school is located based on U.S. Census data (central city, urban fringe/large town, and rural/small town). Grade 4 NAEP data (Table 5) show a greater concentration of charter school *students* in central cities (about 50 percent in grade 4) relative to other public school students (about 30 percent). In fact, in 2003 and 2005, the NAEP sample of charter school students for the eighth grade in the urban fringe/large town and rural/small town areas is so small that it does not meet NAEP data reporting standards (Table 6).

¹² Unpublished tabulations from the NCES 1999-2000 Schools and Staffing Survey.

Table 5. Average mathematics and reading scale scores by school location, grade 4, 2003 and 2005

		Charter Schools			Other Public Schools		
		Weighted Percentage of Students	Average Scale Score	At or Above Basic	Weighted Percentage of Students	Average Scale Score	At or Above Basic
Grade 4 Math							
2003	Central City	50%	221 *	58%	29%	227	67%
	Urban Fringe/Large Town	40%	236	78%	41%	238	80%
	Rural/Small Town	11%	237 !	81%	30%	236	80%
2005	Central City	49%	228	68%	31%	232	73%
	Urban Fringe/Large Town	34%	235	79%	44%	241	83%
	Rural/Small Town	17%	‡	‡	26%	238	82%
Grade 4 Reading							
2003	Central City	51%	205	50%	29%	208	51%
	Urban Fringe/Large Town	37%	220 !	66%	41%	221	66%
	Rural/Small Town	11%	220 !	64%	30%	219	66%
2005	Central City	50%	210	54%	30%	210	54%
	Urban Fringe/Large Town	34%	221	67%	44%	221	67%
	Rural/Small Town	17%	‡	‡	26%	218	64%

*Significantly different from other public schools at the 0.05 level. The statistical significance of changes between 2003 and 2005 is not calculated by the NAEP Data Explorer.

‡ Reporting standards not met.

! The nature of the sample does not allow accurate determination of the variability of the statistic.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

Fourth-Grade Average Scores. In 2003, students scored low both in charter schools and other public schools in central cities, but charter school achievement was worse. Average scale scores for the fourth grade were higher in other public schools than in charter schools in each subject. In urban fringe/large town and rural/small town comparisons, charter schools scored the same as other public schools, suggesting that the charter school performance deficit is confined largely to central-city charter schools. However, the 2003 comparisons outside central cities are not necessarily reliable in the NAEP sample. In central cities, the scale score difference was nearly six points in math and three points in reading—but only the math difference was statistically significant. The math differential is a little more than half a year of schooling and in reading the differential is less than half a year. In 2005, in central cities, the scale score difference was four points in math (not statistically significant) and charter schools scored the same as other public schools in reading.

Changes between 2003 and 2005 based on school location cannot be calculated. The 2003 data in Table 5 came from the NAEP Data Tool prior to October 18, 2005, when the Data Explorer replaced the Data Tool. Now, 2003 data by urban/suburban/rural location are unavailable, possibly because geographic definitions changed. The 2003 data in our report are different than the 2003 data in the AFT's August 2004 NAEP charter school report due to revisions to the charter school sample made by NCES in fall 2004. The revisions resulted in a charter school sample that was far less urban (it had been about 60 percent urban for fourth-grade students and it fell to about 50 percent).

Table 6. Average mathematics and reading scale scores by school location, grade 8, 2005

		Charter Schools			Other Public Schools		
		Weighted Percentage of Students	Average Scale Score	At or Above Basic	Weighted Percentage of Students	Average Scale Score	At or Above Basic
Grade 8 Math							
2005	Central City	71%	267	55%	29%	270	59%
	Urban Fringe/Large Town	15%	‡	‡	44%	282	72%
	Rural/Small Town	15%	276	65%	27%	279	71%
Grade 8 Reading							
2005	Central City	72%	254	64%	29%	254	63%
	Urban Fringe/Large Town	14%	‡	‡	44%	264	75%
	Rural/Small Town	15%	‡	‡	27%	262	74%

*Significantly different from other public schools at the 0.05 level. The statistical significance of changes between 2003 and 2005 could not be computed with the NAEP Data Explorer.

‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

Eighth-Grade Average Scores. In 2005, in central cities, the scale score difference was three points in math (not statistically significant) and the reading scores were the same for students in charter schools and other public schools.

Racial and Ethnic Minority Students

Many reports suggest that charter schools especially appeal to racial and ethnic minorities concentrated in low-achieving public school systems in central cities. In fact, in the NAEP sample, charter schools were approximately twice as likely as other public schools to enroll black students (35 percent compared with 17 percent in grade 4) but about equally likely to enroll Hispanic students (Table 7). Given the predominantly central-city location of charter schools (roughly 50 percent in urban areas compared with 30 percent for other public schools), their higher percentage of black students compared with the percentage in the national sample of other public schools is not surprising. It is surprising, however, that charter schools do not enroll a higher percentage of Hispanic students compared with other public schools, given the greater likelihood of an urban location. The question we turn to next is whether charter schools' disproportionate enrollment of minority students, whose achievement is generally low, may explain the low average performance of charter schools.

NAEP identified students who took the NAEP assessments as belonging to one of five racial/ethnic subgroups or as "other" based on information obtained from school records. Results for Native American and Asian subgroups are not separately shown in Tables 7 and 8 due to their small representation in the charter school sample.

Fourth-Grade Average Scores. When comparing student achievement by race in 2003, white, black and Hispanic fourth-grade math students in charter schools had lower average scale scores than their peers in other public schools, but the differences were small and statistically insignificant. In reading, the gaps were even narrower, with Hispanic charter schools scoring a statistically insignificant two points higher than other public school Hispanic students.

Table 7. Average mathematics and reading scale scores by race/ethnicity, grade 4, 2003 and 2005

		Charter Schools			Other Public Schools		
		Weighted Percentage of Students	Average Scale Score	At or Above Basic	Weighted Percentage of Students	Average Scale Score	At or Above Basic
Grade 4 Math							
2003	White	45%	242	84%	58%	243	87%
	Black	31%	214	51%	17%	216	54%
	Hispanic	20%	219	58%	19%	221	62%
2005	White	42%	245	89%	57%	246	89%
	Black	35%	216	54%	17%	220	60%
	Hispanic	18%	‡	‡	20%	225	67%
Grade 4 Reading							
2003	White	49%	227	73%	59%	227	74%
	Black	29%	195	37%	17%	197	39%
	Hispanic	18%	201	45%	18%	199	43%
2005	White	42%	230	78%	57%	228	75%
	Black	34%	199	40%	17%	199	41%
	Hispanic	19%	211 *	56%	19%	201	44%

*Significantly different from other public schools at the 0.05 level. None of the charter school changes from 2003 to 2005 are statistically significant, while all changes in other public schools are statistically significant.

‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

In 2005, the racial differences between charter and other public school students remained about the same for white and black students. Hispanic students' math performance is unknown because the charter school data did not meet NAEP reporting standards, but charter school Hispanic students scored 10 points higher in reading than Hispanic students in other public schools, and the difference was statistically significant. However, the 10-point change from a scale score of 201 in 2003 to 211 two years later is not a statistically significant change. It is not correct to call the 10-point change a "gain" or "improvement" because both the students and schools in the 2005 sample are completely different from those in the 2003 sample and because the difference in the two samples is statistically insignificant. The black-white achievement gap in charter schools increased by two points in math and decreased by one scale score point in reading—both small and statistically insignificant changes. However, the reduction in the black-white achievement gap in other public schools was statistically significant.

Eighth-Grade Average Scores. When comparing 2005 student achievement by race in eighth-grade math, white and black students in charter schools had lower average scale scores than their peers in other public schools, and the six-point difference for black students was statistically insignificant. Data for Hispanic students did not meet NAEP reporting standards in either subject. In reading, the gaps were narrower, with white charter school students scoring a statistically insignificant two points higher than other public school white students, and black charter school students scoring three points lower than other public school black students.

Table 8. Average mathematics and reading scale scores by race/ethnicity, grade 8, 2003 and 2005

		Charter Schools			Other Public Schools		
		Weighted Percentage of Students	Average Scale Score	At or Above Basic	Weighted Percentage of Students	Average Scale Score	At or Above Basic
Grade 8 Math							
2005	White	40%	284	75%	60%	288	79%
	Black	37%	248 *	34%	16%	254	42%
	Hispanic	17%	‡	‡	17%	261	50%
Grade 8 Reading							
2005	White	39%	271	81%	60%	269	81%
	Black	37%	239	48%	17%	242	51%
	Hispanic	19%	‡	‡	17%	245	55%

*Significantly different from other public schools at the 0.05 level. None of the charter school changes from 2003 to 2005 are statistically significant, while all changes in other public schools are statistically significant.

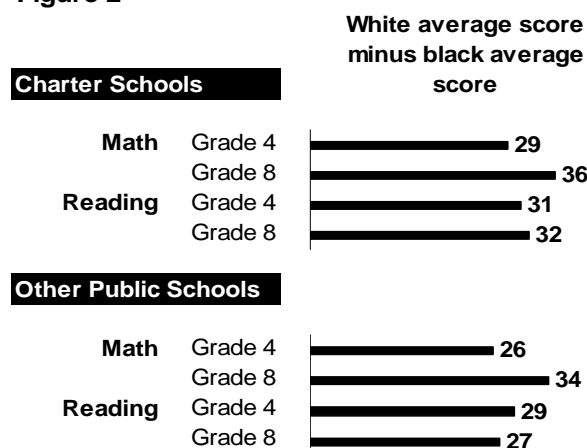
‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics

Achievement Gap. The differences in 2005 scores between white and black students in charter schools and in other public schools are presented in Figure 2, shown to the right. Data on Hispanic students in charter schools were available only for grade 4 reading. Achievement gaps are about the same in charter schools as in other public schools. This evidence suggests that charter schools are not more successful at reducing black-white achievement disparities than are other public schools.

Figure 2



Multivariable Cross-Tabulations

Official NAEP reports have always contained only descriptive data. NAGB policy prohibits officially reporting NAEP scores with officially prepared “adjusted” or “predicted” results because they “would be subject to serious methodological and political challenges and would be contrary to the strong national commitment to encouraging high standards for all children.”¹³

The 2003 AFT report using NAEP data followed NAGB protocol by cross-tabulating outcome measures with only one student characteristic (e.g., poverty, location or race). The data could be analyzed in no

¹³ NAGB, Resolution on Reporting State-Level NAEP Results, March 5, 1994.

other way, since the NAEP Data Tool did not allow for any other approach and the restricted-use student-level data were not available at that time. NAGB's one-variable-at-a-time approach, which we used in the 2003 report, was sharply criticized in the advertisement "[AFT] Charter School Evaluation Reported by *The New York Times* Fails to Meet Professional Standards" (*Education Week* 9/15/04), which called for better family background data and more sophisticated analyses.

The NAEP Data Explorer available with the 2005 data allows for more refined cross-tabulations than were possible in 2003. The next three tables cross-tabulate the percentage of charter school and other public school students (and average mathematics scale scores):

- by eligibility for free/reduced-price school lunch in central cities;
- by race/ethnicity in central cities; and
- for white and black students by eligibility for free/reduced-price school lunch.

However, simple cross-tabulation is not a statistically efficient way to generate precise multivariable estimates in complex surveys using a clustered or multistage sample design. Hierarchical linear modeling (HLM)¹⁴ is often used when the population has a hierarchical structure like in NAEP, where students are sampled within a classroom, classrooms are sampled within a school and schools are sampled within a state. Under a contract with NCES, the Educational Testing Service in 2004 completed an HLM study of the 2003 NAEP charter school data and it is expected to be released to the public in January 2006. The 2005 student-level NAEP data required for HLM analysis is not yet available to outside researchers.

Eligibility for free/reduced-price school lunch in urban locations. The evidence suggests that central-city charter schools students are slightly less likely to be eligible for free or reduced-price lunch, but the difference is not statistically significant. Although 9 percent of charter school fourth-graders and 13 percent of charter school eighth-graders have not reported their school-lunch status, it is likely that most would fall into the "not eligible" category: Table 11, for example, shows that white charter schools students are nearly three times more likely than black charter school students to have not reported free-lunch status (25 percent compared with 9 percent). With regard to student achievement, only the eighth-grade data met NAEP reporting standards and the results show in Table 9 that eligible charter school students were three scale score points behind their peers in other public schools and not eligible students fell 10 points back. These results are not markedly different than those presented in Tables 4 or 6.

¹⁴ See Note 3.

Table 9. Average mathematics scale scores in urban locations by eligibility for free/reduced-price school lunch, grades 4 and 8, 2005

	Grade 4 Math in Central Cities			Grade 8 Math in Central Cities		
	Eligible	Not Eligible	Not Available	Eligible	Not Eligible	Not Available
Percent Eligible						
Charter School	56	35	9	48	40	13
Other Public Schools	62	37	2	53	44	3
Average Scale Score						
Charter School	‡	‡	‡	255	276	‡
Other Public Schools	223	247	‡	258	286	268

*Significantly different from other public schools at the 0.05 level.

‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

Race/ethnicity in central cities. The distribution of students by race in central cities clearly shows that charter schools cater proportionally more to black students and proportionally less to Hispanic students than other public schools in central cities, with white students making up about one-third of the sample in both charter and other public schools. The only achievement comparison meeting NAEP data reporting standards showed that eighth-grade black students in central-city charter schools scored three points lower than black students in other public schools (Table 10).

Table 10. Average mathematics scale scores by race/ethnicity in central cities, grades 4 and 8, 2005

	Grade 4 Percent of Students	Grade 8 Percent of Students	Grade 4 Scale Score	Grade 8 Scale Score
White				
Charter School	30	32	‡	‡
Other Public Schools	33	37	247	288
Black				
Charter School	50	45	‡	249
Other Public Schools	27	27	218	252
Hispanic				
Charter School	15	18	‡	‡
Other Public Schools	32	28	224	259

*Significantly different from other public schools at the 0.05 level.

‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments.

White and black students by eligibility for free/reduced-price school lunch. According to a recent review of charter school student achievement studies by the Economic Policy Institute, modest evidence

in the 2003 NAEP suggests that charter schools cater to more affluent black families.¹⁵ This finding appears to hold for the 2005 NAEP. In this cross-tabulation, breakdowns of student achievement did not meet reporting standards in grade 8 for black students or in any grade for Hispanic students. In grade 4, black students in charter schools and those in other public schools scored about the same. This finding is much like the one in Table 7.

Table 11. Average mathematics scale scores for white and black students by eligibility for free/reduced-price school lunch, grades 4 and 8, 2005

	Grade 4 Math			Grade 8 Math		
	Eligible	Not Eligible	Not Available	Eligible	Not Eligible	Not Available
Percent Eligible						
White						
Charter School	19	63	18	23	52	25
Other Public Schools	27	71	2	23	75	2
Black						
Charter School	68	25	7	58	33	9
Other Public Schools	74	25	1	67	31	2
Average Scale Score						
White						
Charter School	‡	247	‡	‡	‡	‡
Other Public Schools	234	250	247	273	292	290
Black						
Charter School	215	222	‡	‡	‡	‡
Other Public Schools	216	230	220	250	264	258

*Significantly different from other public schools at the 0.05 level.

‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Significance tests were performed using unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 and 2005 Reading and Mathematics Assessments

Overall, the multivariable cross-tabulations failed to find any noteworthy deviation from the simple cross-tabulations. However, more sophisticated multivariable analyses, such as HLM, could yield a very different conclusion.

¹⁵ Carnoy et al., *The Charter School Dust-Up*.

Technical Appendix

Note: The information in this appendix is drawn directly from official NAEP reporting.

Background Information. Beginning in 2002, the NAEP national sample was obtained by aggregating the samples from each state, rather than by obtaining an independently selected national sample. As a consequence, the size of the national sample increased, and smaller differences between years or between types of students were found to be statistically significant than would have been detected in previous assessments. NAEP permits students with disabilities or limited-English proficient students to use certain accommodations (e.g., extended time, small group testing).¹⁶

Statistical Significance. Average test scores have a standard error—a range of up to a few points above or below the score—due to sampling error and measurement error. Statistical tests are used to determine whether the differences between average scores are significant; therefore, not all apparent differences may be found to be statistically significant. All the differences discussed in this report were tested for statistical significance at the 0.05 level.

Achievement Levels. Achievement levels are performance standards set by NAGB to provide a context for interpreting student performance on NAEP. These performance standards, based on recommendations from panels of educators and members of the public, are used to report what students should know and be able to do at the *Basic*, *Proficient*, and *Advanced* levels of performance in each subject area and at each grade assessed.

Basic: This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.

Proficient: This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject matter knowledge, application of such knowledge to real-world situations and analytical skills appropriate to the subject matter.

Advanced: This level signifies superior performance.

The minimum scale scores for achievement levels are as follows:

	<u>Grade 4</u>	<u>Grade 8</u>
Basic	214	262
Proficient	249	299
Advanced	282	333

Weighted percentage. A weighted percentage is calculated by differentially weighting cases, as opposed to a simple percentage in which all cases are equally weighted. For example, the simple percentage of students in a NAEP sample who answer an item correctly is calculated by tallying the number of students in the sample who provided correct answers, dividing this number by the total sample size and multiplying the result by 100. The weighted percentage is calculated by tallying the sum of the weights for students answering the item correctly, dividing by the sum of the weights for the total sample and multiplying by 100.

¹⁶ U.S. Department of Education, National Center for Education Statistics, *The Nation's Report Card: Mathematics Highlights 2003* (Washington, D.C.: NCES, 2003).

In NAEP, each sampled student is assigned a weight that makes proper allowances for NAEP's sampling design and reflects adjustments for school and student nonparticipation. Weighted percentages are estimates of the percentages of the total population, or population subgroup, that have a specified characteristic. For example, the weighted percentage of fourth-grade students in the NAEP sample who correctly answered a particular NAEP test item is an estimate of the percentage of fourth-grade students in the nation who can correctly answer that question.