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## END-OF-COURSE MULTIPLE-CHOICE TEST RESULTS, 2007-08

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### ABSTRACT

*End-of-Course (EOC) tests are given statewide in ten courses typically taken in high school. Results for 2007-08 (and prior years, where available) are reported in terms of both average scale scores and the percentage of students who scored proficient. After the recent introduction of new EOC tests, scores for students in WCPSS have begun to tick back upward after a decline attributable to higher standards on those new tests. However, significant gaps in achievement are still evident, and proficiency rates have not fully recovered to the levels seen prior to these new tests. Higher standards, coupled with new EOC-based graduation requirements and a changing student population continue to pose significant challenges to ensuring success for all students.*

### BACKGROUND

The North Carolina Department of Public Instruction (NCDPI) requires that all public schools administer End-of-Course (EOC) tests to students enrolled in 10 courses usually taken in high school. EOC tests are typically given during the last two weeks of the course. Results are then used for state accountability programs and to help determine whether students meet the state's recently-enacted high school exit standards, which require students to pass five specific EOC tests in order to graduate from high school<sup>1</sup>.

EOC tests are aligned with the Standard Course of Study in each of the subjects tested - Algebra I, Algebra II, Geometry, English I, Biology, Chemistry, Physical Science, Physics, U.S. History, and Civics & Economics - and use a multiple-choice format. NCDPI has recently revised the curriculum

<sup>1</sup> See <http://www.ncpublicschools.org/docs/accountability/policyoperations/exitstandards/exitstandardsguidehs.pdf> for more information.

and associated EOC tests for the eight mathematics, English, and science courses, resulting in higher standards and more difficult tests.

Student performance on EOC multiple-choice tests is measured by both a scale score and achievement level. There are four achievement levels, each representing a different level of competency in a subject area (Table 1). Table 2 shows the range of scale scores associated with each achievement level for each of the 10 EOC tests administered in 2007-08. In this report, End-of-Course results will be presented using two types of measurements: the percentage of students scoring at or above Achievement Level III (i.e., proficiency rates) and average scale scores.

**Table 1**  
**Achievement Levels for the North Carolina Testing Program**

<b>Level I:</b> Students performing at this level do not have sufficient mastery of knowledge and skills of the course to be successful at a more advanced level in the content area.	<b>Level III:</b> Students performing at this level consistently demonstrate mastery of the course subject matter and skills and are well prepared for a more advanced level in the content area.
<b>Level II:</b> Students performing at this level demonstrate inconsistent mastery of knowledge and skills of the course, and are minimally prepared to be successful at a more advanced level in the content area.	<b>Level IV:</b> Students performing at this level consistently perform in a superior manner clearly beyond that required to be proficient in the course subject matter and skills and are very well prepared for a more advanced level in the content area.

Note: Official descriptions vary by course, and are listed in NC State Board of Education Policy GCS-C-010 (see <http://sbepolicy.dpi.state.nc.us/> for more details.)

**Table 2**  
**EOC Achievement Levels by Scale Score Ranges, 2007-08**

<u>Description</u>	<u>Level I</u>	<u>Level II</u>	<u>Level III</u>	<u>Level IV</u>
Algebra I	Less than or equal to 139	140-147	148-157	Greater than or equal to 158
Algebra II	Less than or equal to 138	139-146	147-157	Greater than or equal to 158
Biology	Less than or equal to 137	138-146	147-158	Greater than or equal to 159
Chemistry	Less than or equal to 136	137-145	146-157	Greater than or equal to 158
Civics and Economics	Less than or equal to 140	141-147	148-159	Greater than or equal to 160
English I	Less than or equal to 137	138-145	146-156	Greater than or equal to 157
Geometry	Less than or equal to 138	139-147	148-157	Greater than or equal to 158
Physics	Less than or equal to 138	139-142	143-156	Greater than or equal to 157
Physical Science	Less than or equal to 139	140-148	149-159	Greater than or equal to 160
US History	Less than or equal to 139	140-148	149-159	Greater than or equal to 160

In addition to being differentiated by subject area, EOC tests are also sometimes categorized as either “core” or “elective.” The five core EOCs – Algebra I, English I, Biology, U.S. History, and Civics & Economics – are taken by the vast majority of high school students. Beginning with the

incoming 9th-grade class of 2006-07, students statewide have to meet proficiency requirements on each of those five tests in order to graduate from high school. The remaining five EOCs – Algebra II, Geometry, Physical Science, Chemistry, and Physics – can be thought of as elective EOCs because those courses are not explicitly required for graduation, and therefore not all students will take them.

When taking stock of EOC test performance, several contextual factors need to be considered. While the five core EOCs are taken by the vast majority of high school students, the elective EOCs are taken by a less representative population of students. Higher-level mathematics and science EOCs are less likely to include students who struggle academically, as they are not as likely to enroll in those courses in the first place, particularly Physics. On the other hand, those students are more likely than others to enroll in Physical Science. Therefore, the performance of students on those elective EOC tests is not always representative of the entire high school population.

Also, test results for a relatively small number of WCPSS students who take alternate versions of EOC tests (i.e., NCEXTEND2 and NCCLAS) are not included here, as the scores resulting from those assessments are not directly comparable to those from the regular multiple-choice EOC tests. These students are typically either students with disabilities (SWD) or students who are limited English proficient (LEP)<sup>2</sup>.

## OVERALL RESULTS

Between 2005-06 and 2007-08, all ten of the NC End-of-Course tests were revamped due to changes in the curriculum. Therefore, the ability to compare results over time on any of those tests is somewhat compromised. The results presented below will use whatever results are available for the current edition of those tests except where noted.

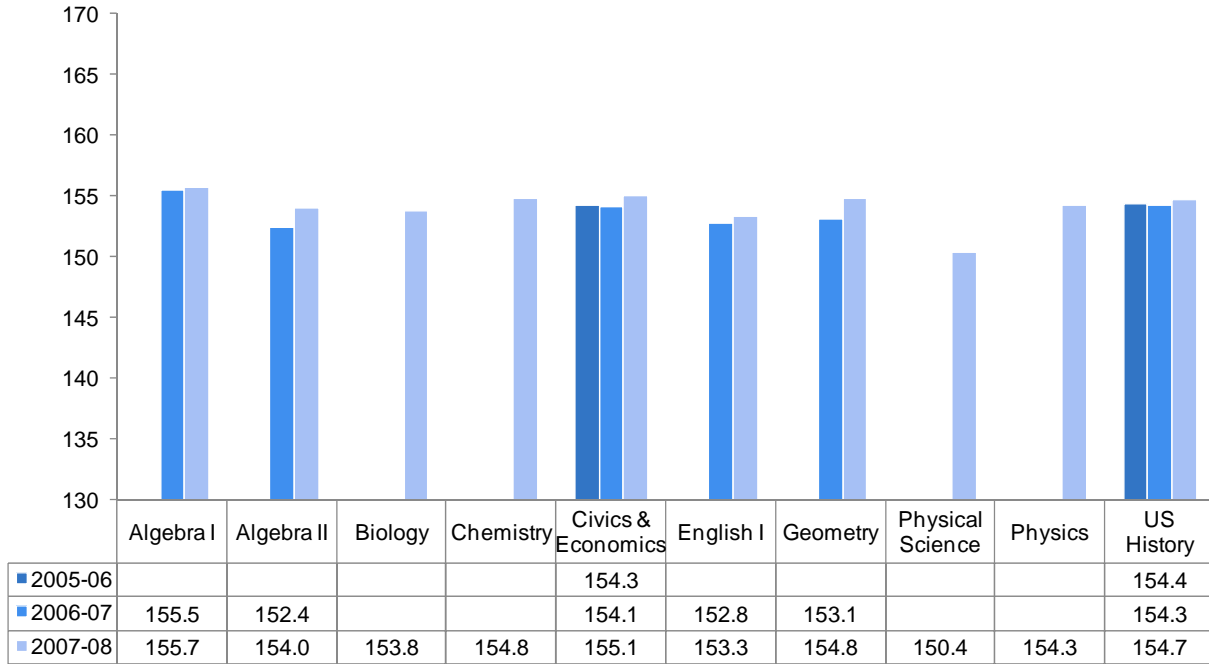
As shown in Figure 1, average WCPSS EOC scale scores rose slightly in 2007-08 in each subject for which at least two years of data were available. Scale scores prior to 2006-07 are not shown for mathematics EOCs and prior to 2007-08 for science EOCs, as the scales on which those tests are measured changed when new tests were introduced, rendering average scale scores non-comparable to previous years.

Although the scale scores reported for each EOC test are in the 100s range for each course, average scale scores cannot be compared across courses (e.g., comparing Algebra I to Geometry, etc.), because the underlying scales are not identical (see Table 2). Therefore the only valid comparisons in Figure 1 are the year-to-year changes for an individual test.

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<sup>2</sup> The results of alternate assessments are included in a separate report (see [http://www.wcpss.net/evaluation-research/reports/2009/0907alt\\_assess08.pdf](http://www.wcpss.net/evaluation-research/reports/2009/0907alt_assess08.pdf)).

**Figure 1**  
**WCPSS Average EOC Scale Scores, 2005-06 to 2007-08**

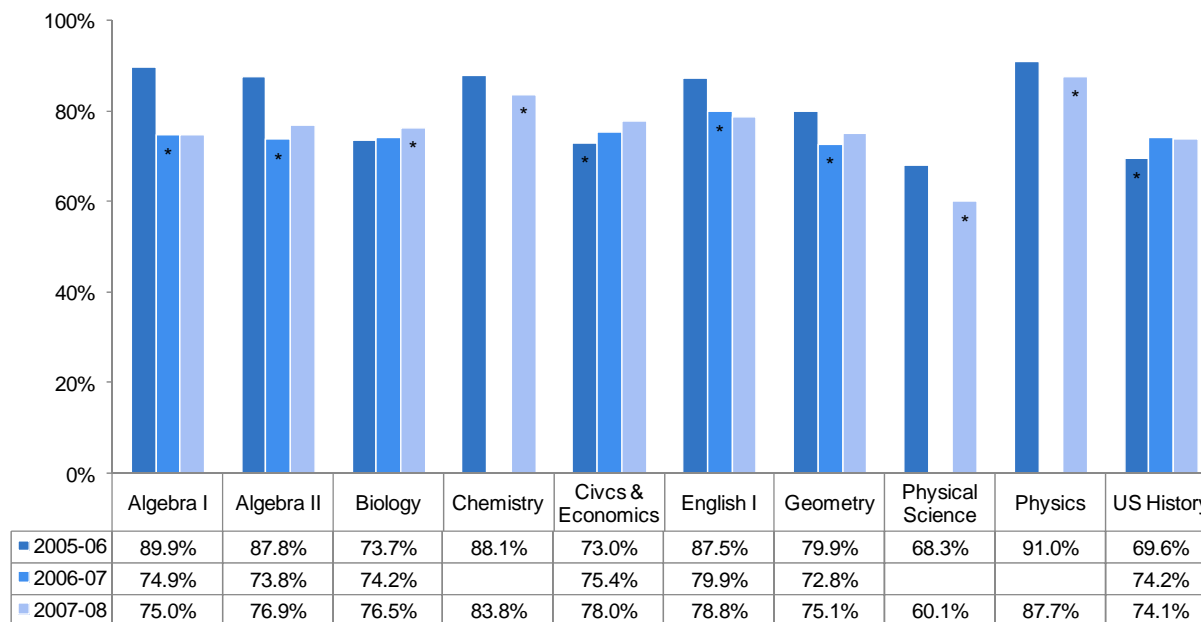


Note: Scale scores are not shown where the scales changed when new tests were introduced.

While average scale scores provide a more precise measurement of student performance, EOC test results are also typically reported as the percentage of students scoring “proficient”. Students achieving a scale score that falls into the Levels III and IV range (Table 1) are considered proficient according to State Board of Education policy.

Figure 2 shows WCPSS proficiency results on each of the 10 EOCs since 2005-06. Results were not available for Chemistry, Physical Science, and Physics in 2006-07, as those tests were taken offline that year, with new updated versions implemented in 2007-08. Bars representing the introduction of a new edition of a test are marked with an asterisk (“\*”).

**Figure 2**  
**WCPSS EOC Proficiency Rates, 2005-06 to 2007-08**



Note: Bars representing the introduction of a new edition of a test are marked with an asterisk (“\*”).  
Blanks indicate years that no tests were administered for those subjects.

As shown in Figure 2, the percentage of WCPSS students scoring in Levels III or IV on EOC exams scores rose slightly between 2006-07 and 2007-08 in each subject except U.S. History and English I. The results for English I and U.S. History are particularly interesting in that while the proficiency rate went down by 1.1 and 0.1 percentage points in 2007-08, the *average* scores actually went up (Figure 1).

Three of the four science tests that were new in 2007-08 showed a decline in proficiency rates when compared to the previous version of the test. The same pattern was evident in 2006-07, when new tests were introduced in the three mathematics courses as well as English I. Since 2006-07, Biology is the only course where WCPSS proficiency rates did not decline when a new edition of the test was introduced. This general drop in proficiency with the introduction of new EOC tests is consistent with the statewide results on those same tests, although the changes statewide tended to be more dramatic<sup>3</sup>.

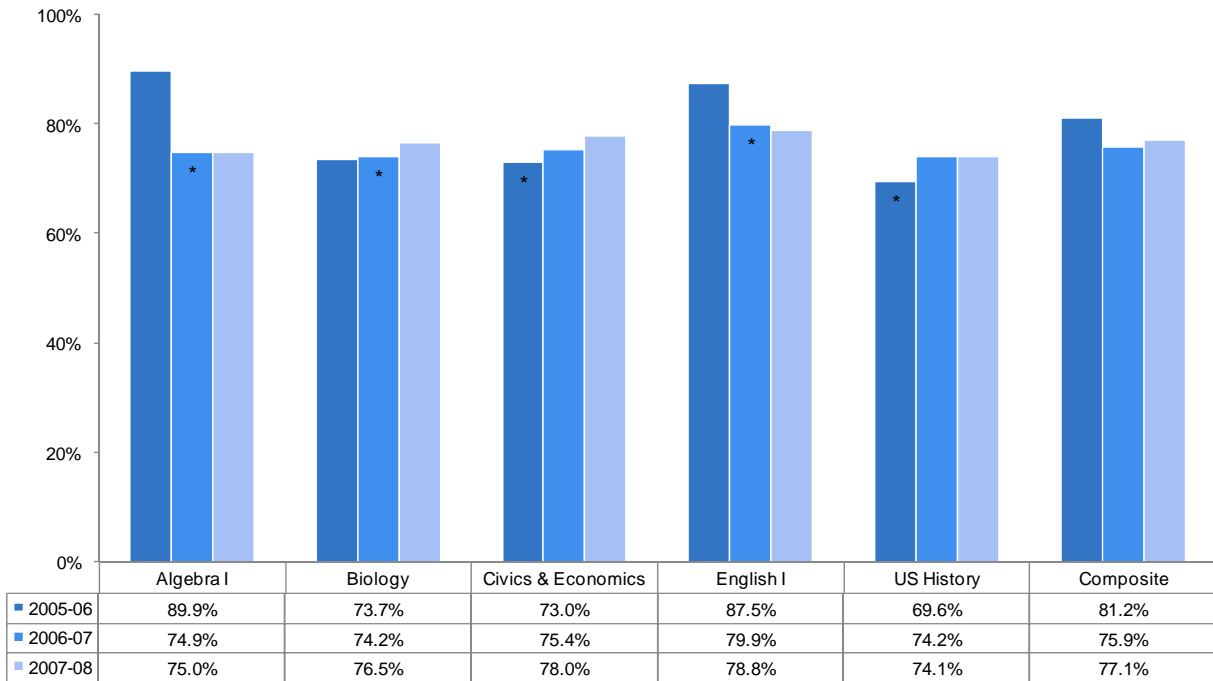
<sup>3</sup> See <http://www.ncpublicschools.org/accountability/reporting/leaperformancearchive/> for more information on statewide results.

## COMPOSITE EOC PERFORMANCE OVER TIME

Figure 3 details the trend in overall EOC performance by displaying the percentage of EOC scores at or above Level III across the five tests that are part of the state’s high school exit standards policy. Beginning with the incoming 9<sup>th</sup> grade class of 2006-07, students are required to pass each of these five tests at some point during their high school careers in order to be eligible for a diploma. As such, these courses are taken by almost every student who completes high school, while the population of students who take the other five tests is often less representative of high school students as a whole.

Of the more than 50,000 exit standards EOC exams taken by WCPSS students in 2007-08, over 77% resulted in scores at or above Level III (Figure 3). This represented a slight increase over the previous year after a dip in 2006-07. As noted previously, new tests in Algebra I and English I were introduced in 2006-07 which resulted in a lower overall proficiency rate that year across these five tests.

**Figure 3**  
**WCPSS EOC Proficiency Across the Five Exit Standards Courses, 2005-06 to 2007-08**



Note: Bars representing the introduction of a new edition of a test are marked with an asterisk (“\*”).

## **RESULTS BY SUBGROUP**

Figures in Appendix A show the percentage of students who scored at or above Level III (i.e., proficient) on each EOC exam between 2005-06 and 2007-08 for various student subgroups. The figures in Appendix B show the scale score results for these same tests and subgroups. The results described in this section are based on the data in those figures. The proficiency gap, as we discuss it in this report, is the difference in the percentage of students scoring at Level III or IV (proficient) between the highest and lowest-performing subgroups on any one EOC test.

In this report, we will not be discussing results for WCPSS's American Indian students, even when we are making observations among all ethnic subgroups. American Indian students comprise a very small group, making comparisons unfeasible because results based on such a small group of students tend to fluctuate widely. Results for American Indian students are however included in the graphs in the appendices.

### **ETHNICITY**

Large differences among ethnic groups are evident in both mean scale scores and the percentage of students scoring at Level III or IV on EOC tests. Similar to previous years, White and Asian students had the highest proficiency rates and mean scale scores in 2007-08. White students achieved their highest proficiency rate on the English I exam (93.2%), while the highest proficiency rate for Asian students was in Physics (94.3%). Black/African American students had the lowest proficiency rates and mean scale scores among all racial and ethnic groups on nine of the 10 tested subjects. The proficiency gap (i.e., the difference in the percentage of students scoring at Level III or IV) between Black/African American students and White students in 2007-08 varied by course, ranging from a low of 26.9 percentage points in Chemistry to 40.3 percentage points in Algebra I.

Changes in proficiency rates by ethnic group varied by group and by course, although most ethnic groups saw some increase in at least three of the six comparable EOC courses. Average scale scores remained level or increased in 2007-08 on every test for every ethnic subgroup except for Asian students in Algebra I. The percentage of Multiracial students scoring proficient increased in all six EOC courses where comparisons can be made: Algebra I, Algebra II, English I, Geometry, Civics & Economics, and U.S. History. Similarly, Black/African American students saw proficiency increases in five of the six courses (all except English I) and average scale score increases in all six. The percentage of White students scoring proficient increased slightly on four out of the six tests that allow a multi-year analysis (Algebra I, Algebra II, Geometry, and Civics & Economics) and average scale scores for White students increased in all six.

### **STUDENTS WITH DISABILITIES (SWD)**

The percentage of students with disabilities (SWD) scoring proficient was highest in Physics (77.0%), and surpassed 60% in three other subject areas: Geometry (60.2%), Algebra II (63.1%), and Chemistry (74.3%). The lowest proficiency rate for this group was in Physical Science (45.6%), a subject that is the lowest-scoring exam for most other student subgroups as well. U.S. History and English I were the only two of the six comparable EOC tests on which the proficiency rate for students with disabilities did not increase in 2007-08. Average scale scores for the SWD subgroup remained level or increased in 2007-08 in every subject except Algebra I.

## **STUDENTS WITH LIMITED ENGLISH PROFICIENCY (LEP)**

The highest proficiency rate for LEP students in 2007-08 was in Physics (85.2%). The lowest proficiency rates were in Civics & Economics (41.8%) and English I (37.4%). LEP students made gains in proficiency in all six EOC tests that allow comparison to earlier years. This gain was greatest in U.S. History where proficiency rates increased 13.9 percentage points between 2006-07 and 2007-08. Average scale scores for LEP students increased in all six of the EOCs implemented in both 2006-07 and 2007-08.

## **STUDENTS ELIGIBLE FOR FREE OR REDUCED-PRICE LUNCH (FRL)**

The percentage of FRL students scoring at Level III or IV was greater than 50% in seven of the 10 EOC tests. The lowest proficiency percentages for this group were in U.S. History (47.5%) and Physical Science (45.6%). The percentage of FRL students scoring proficient increased in four out of the six tests from 2006-07 to 2007-08: Algebra I (0.2 percentage points), Algebra II (5.1), Civics & Economics (3.0), and Geometry (5.1). Average scale scores for FRL students increased in all of the EOCs implemented in both 2006-07 and 2007-08 except U. S. History.

## **PROFICIENCY TRENDS BY ETHNICITY - CORE COURSES**

### **Algebra I**

Proficiency percentages for Algebra I show that half of the ethnic groups saw gains since the last new test (Figure A1). Scores were highest for White students (90.2 %) and Asian students (89.2 %). Overall increases between 2006-07 and 2007-08 were largest for Multiracial students (5.4 percentage point increase), followed by Black/African American students (2.4 points), and then White students (1.1 points). While Black/African American students saw gains in proficiency, overall that group scored the lowest (49.9%). The proficiency gap between the highest group (White) and lowest (Black/African American) was 40.3 percentage points; only Geometry had a larger proficiency gap between the highest and lowest groups (Asian and Black/African American) in 2007-08.

### **Biology**

A new test for Biology was introduced in 2007-08, but it did not have the usual negative impact on scores observed with most new tests. Even so, comparisons should not be made to earlier years. Proficiency of 75% or better was achieved by three of the six ethnic groups (Figure A2): White students (91.4%), Asian students (90.0%), and Multiracial students (78.9%). The largest proficiency gap was found between White students and Black/African American students (40 points).

### **Civics & Economics**

Proficiency rates in Civics & Economics increased for all ethnic groups (Figure A3) except Asian students (-3.3 percentage points). Unlike many of the other tests, the Civics & Economics test has remained unchanged since 2005-06. Therefore, we can accurately make comparisons across testing

years. The largest proficiency gap is between White and Black/African American students (36.3 percentage points) with an overall decrease in the gap of 2.1 percentage points since 2005-06.

### **English I**

Proficiency rates for English I show steady or slightly decreasing rates for most ethnic groups (Figure A4). Increases between 2006-07 and 2007-08 were seen only among Asian students (2.0 percentage points) and Multiracial students (0.3 points). The highest proficiency rate was found among White students (93.2%). The gap between highest and lowest performing ethnic groups was between White and Hispanic/Latino student groups at 38.0 percentage points.

### **U.S. History**

U.S. History is the other test that has not experienced any changes since 2005-06. Proficiency rates are continuing to rise for most ethnic groups albeit slowly (Figure A5). White students had the highest proficiency levels in 2007-08 (85.2%), although this was a slight decrease from the prior year (-0.3 percentage points). The gap between the highest performing (White students) and lowest performing (Black/African American) ethnic groups was 35.0 percentage points, but continues to close steadily. Black/African American students and Multiracial students have the highest increases in proficiency for U.S. History since 2005-06 (7.5 percentage points).

## **NON-CORE COURSES**

### **Algebra II**

Algebra II results also show improvement for most ethnic groups since the new test was introduced in 2006-07 (Figure A6). Increases in proficiency between 2006-07 and 2007-08 were greatest for Black/African American students (5.2 percentage points) and lowest for Asian students (0.6 percentage points). Although a proficiency gap still exists between White and Black/African American student groups in Algebra II, the gap decreased by 2.2 percentage points between 2006-07 and 2007-08, one of the largest changes seen this year.

### **Chemistry**

A new test was introduced in 2007-08 for Chemistry (Figure A7). The percentage of students scoring at Level III or IV surpassed 75% in five out of six ethnic groups: Asian students (93.5%), White students (88.0%), American Indian students (87.5%), Multiracial students (84.1%), and Hispanic/Latino students (80.7%). The largest performance gap was seen between White students and Black/African American students (32.4%).

### **Geometry**

Proficiency rates for Geometry have increased among all ethnic groups since 2006-07 (Figure A8). Between 2006-07 and 2007-08, increases in proficiency rates were largest for Hispanic/Latino students (6.0 percentage points) and Black/African American (5.5 percentage points). The proficiency gap between the highest (Asian) and lowest performing (Black/African American) ethnic

group in Geometry was 43.9 percentage points; while this was the largest proficiency gap on any EOC test in 2007-08, there was still a narrowing of the gap by 2.3 percentage points.

### **Physical Science**

A new test for Physical Science was implemented in 2007-08 (Figure A9). Only White students had a proficiency rate at or above 75%. The proficiency gap between the highest (White) and lowest (Black/African American) ethnic groups was 31.4 percentage points.

### **Physics**

Physics proficiency rates have historically been among the highest across the EOCs (Figure A10), in part because it is a course that is generally taken by a select group of higher-achieving students. Physics was another course that had a new test introduced in 2007-08. All ethnic groups except Black/African American scored above 70% proficient.

## SUMMARY

End-of-Course (EOC) test results in WCPSS showed some positive trends overall between 2006-07 and 2007-08. The most prominent proficiency gains in 2007-08 were in Geometry, Civics & Economics, and Algebra II, with other subjects showing little or no change since 2006-07. Average scale scores also increased for most subgroups on most EOC tests in 2007-08. Most of the declines in proficiency rates since 2005-06 were due to the introduction of higher standards for those tests, giving hope that future results will bounce back to show the gradual upward trend evident in other subjects.

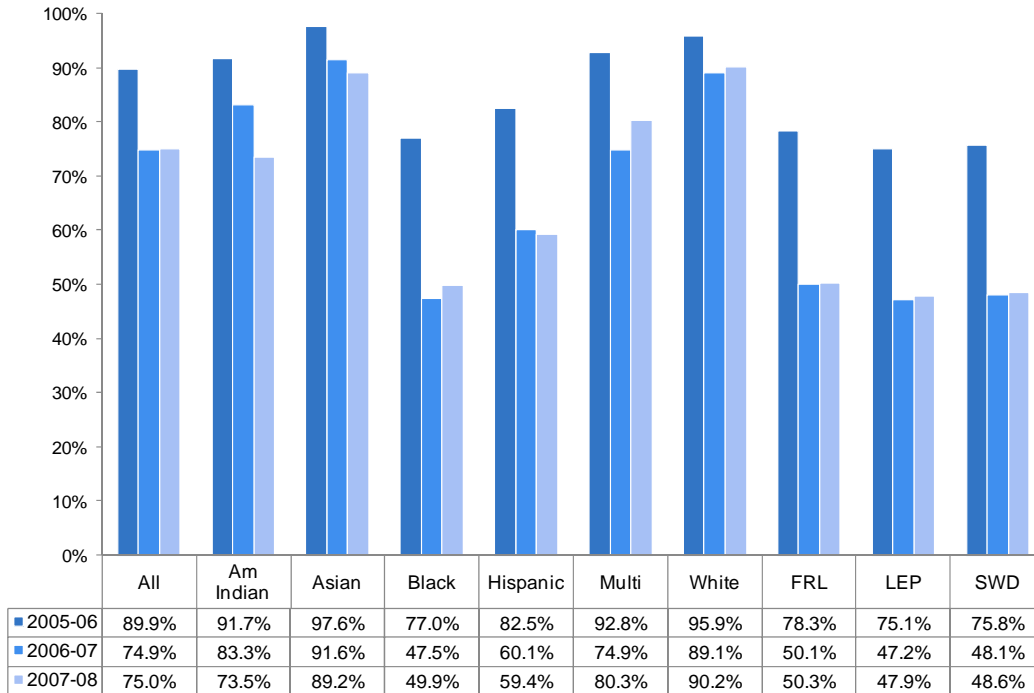
With respect to the performance of different subgroups, similar patterns exist on most EOC tests among the ethnic groups, with Asian and White students generally outperforming their peers regardless of the subject area. With respect to proficiency gaps, it is clear that the introduction of new standards in some EOCs has resulted in a widening of achievement gaps between ethnic groups. In terms of other subgroups, students who are designated as limited English proficient still lag behind their English-speaking peers as well, but have posted sizable gains in recent years, especially on the five core EOCs required for graduation.

Over the past few years, the resetting of standards on EOC tests have caused some drops in proficiency rates. Results from the 2007-08 school year suggest that WCPSS students are reclaiming some of the lost ground on those measures, albeit very slowly. This raising of standards has clearly had an unequal impact on different subgroups of students, with those who had historically underperformed their peers being pushed even farther behind as these new assessments and standards have been adopted (See Appendix A). Many of these subgroups are also showing some of the biggest jumps in performance after that first year of new tests, suggesting that progress is possible in re-closing those gaps. However, the average scale scores on those core EOCs for those subgroups (Appendix B) remains in many cases just at or even below the threshold for proficiency (Table 2), suggesting that the “typical” student in those subgroups is still barely meeting the state’s performance expectations.

Nonetheless, current proficiency rates on some of these tests are still at or around 50% for several subgroups of students, including Hispanic/Latino students, Black/African American students, students with disabilities, students from lower-income backgrounds, and students with limited English proficiency. Since many of these same subgroups are the ones that are growing fastest in number and proportion in the WCPSS student population, it is imperative that progress for these groups accelerate. If not, both the number and proportion of students not meeting the graduation requirement of passing the five core EOCs that was put into place beginning with the 9<sup>th</sup> grade class of 2006-07 will undoubtedly increase. EOC testing results are often used as an indicator of the extent to which high school students are being prepared for their future, whether that future involves postsecondary education or some other calling. If success rates for these subgroups of students continue to languish, not only will it increasingly chip away at the system’s historical reputation for high student performance, it will suggest that an increasingly large population of students is leaving school without the tools they need to achieve their full potential.

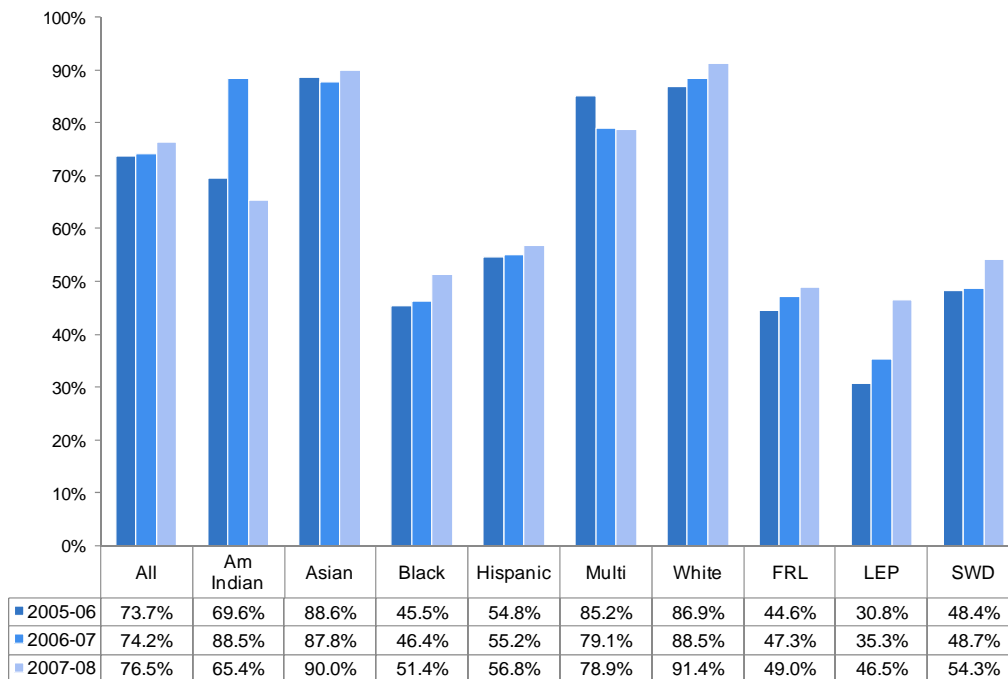
## Appendix A

### Figure A1 Proficiency Rates Algebra I 2005-06 to 2007-08



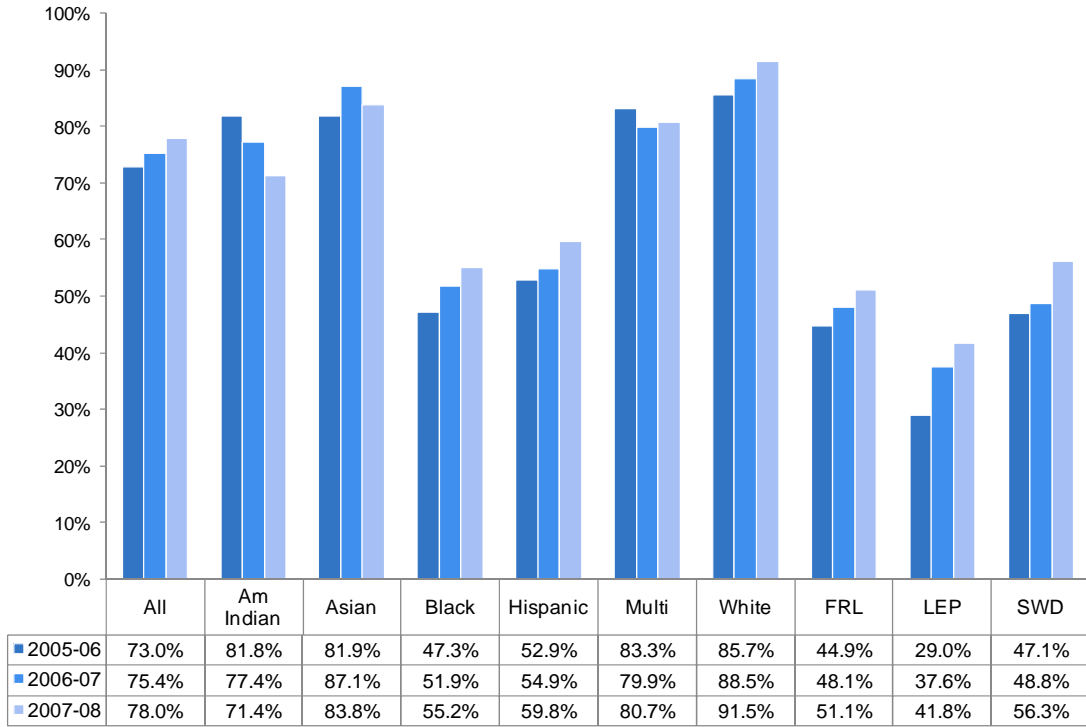
Note: A new Algebra I test was introduced in 2006-07.

### Figure A2 Proficiency Rates Biology 2005-06 to 2007-08

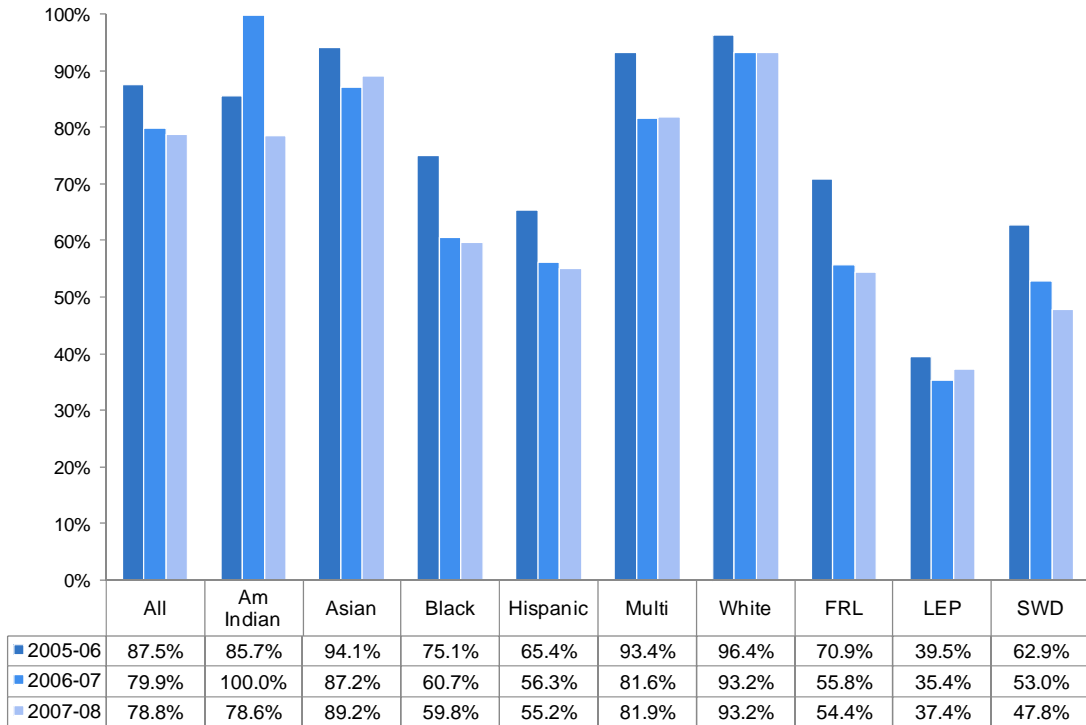


Note: A new Biology test was introduced in 2007-08.

**Figure A3**  
**Proficiency Rates Civics & Economics 2005-06 to 2007-08**

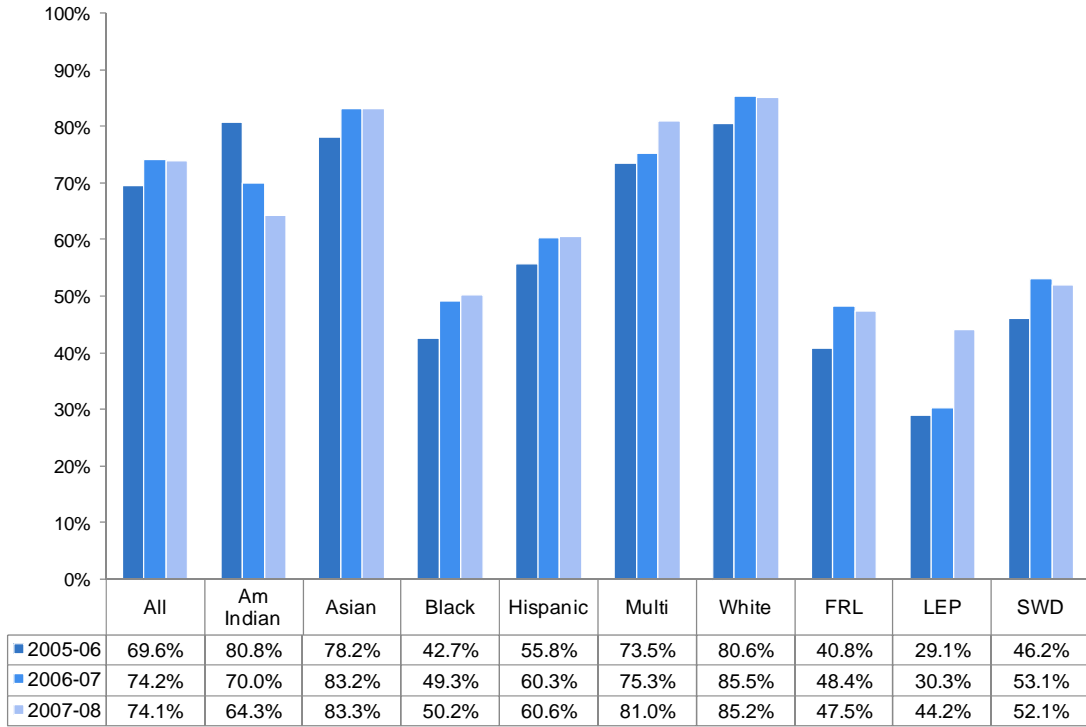


**Figure A4**  
**Proficiency Rates English I 2005-06 to 2007-08**

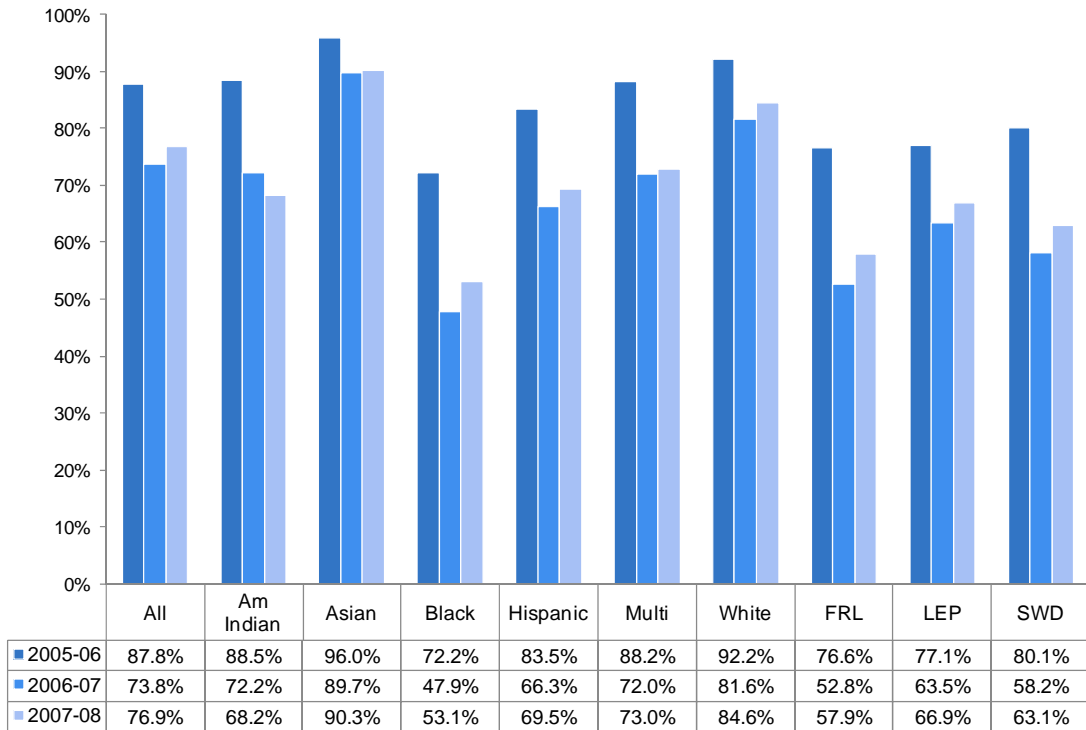


Note: A new English I test was introduced in 2006-07.

**Figure A5**  
**Proficiency Rates U.S. History 2005-06 to 2007-08**

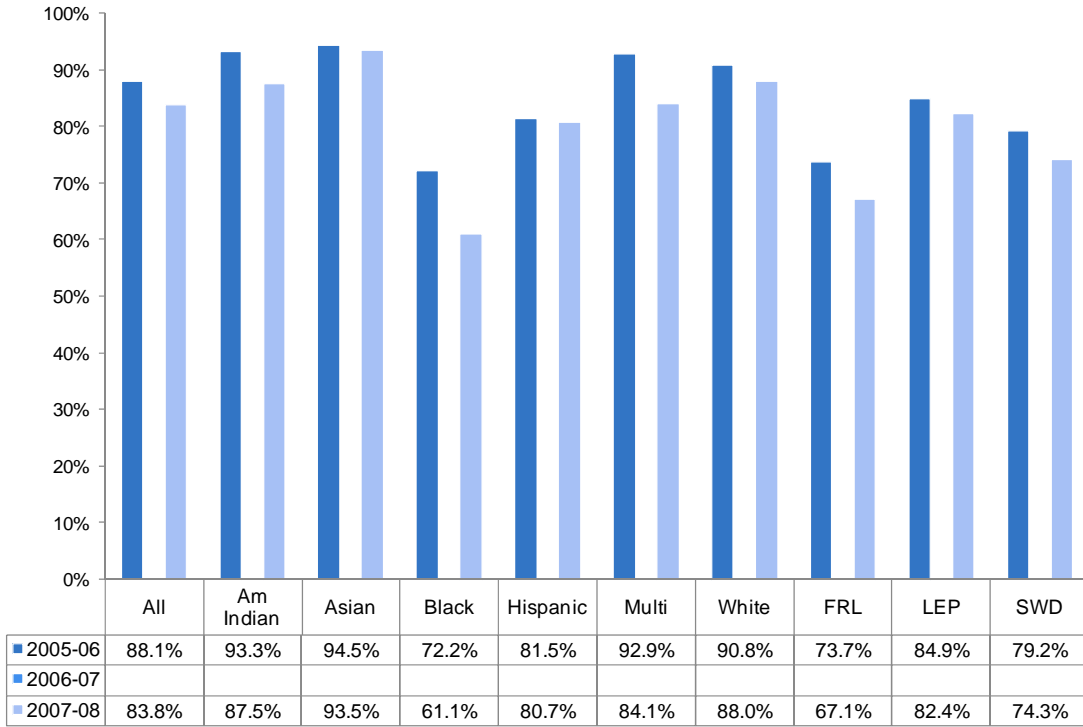


**Figure A6**  
**Proficiency Rates Algebra II 2005-06 to 2007-08**



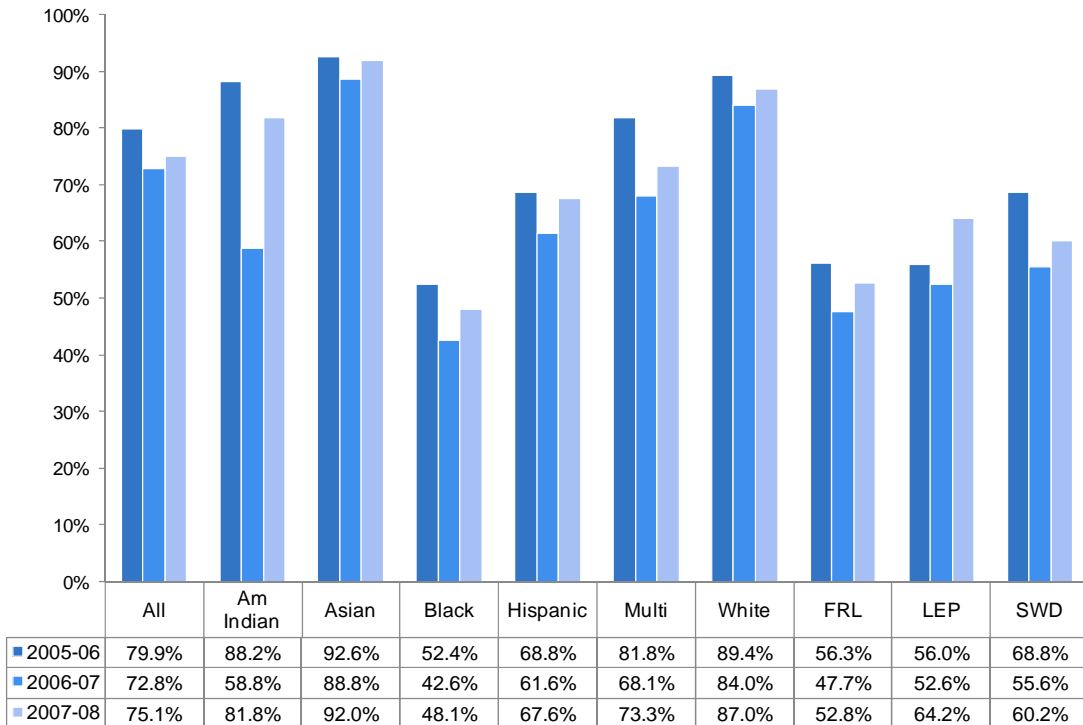
Note: A new Algebra II test was introduced in 2006-07.

**Figure A7**  
**Proficiency Rates Chemistry 2005-06 to 2007-08**



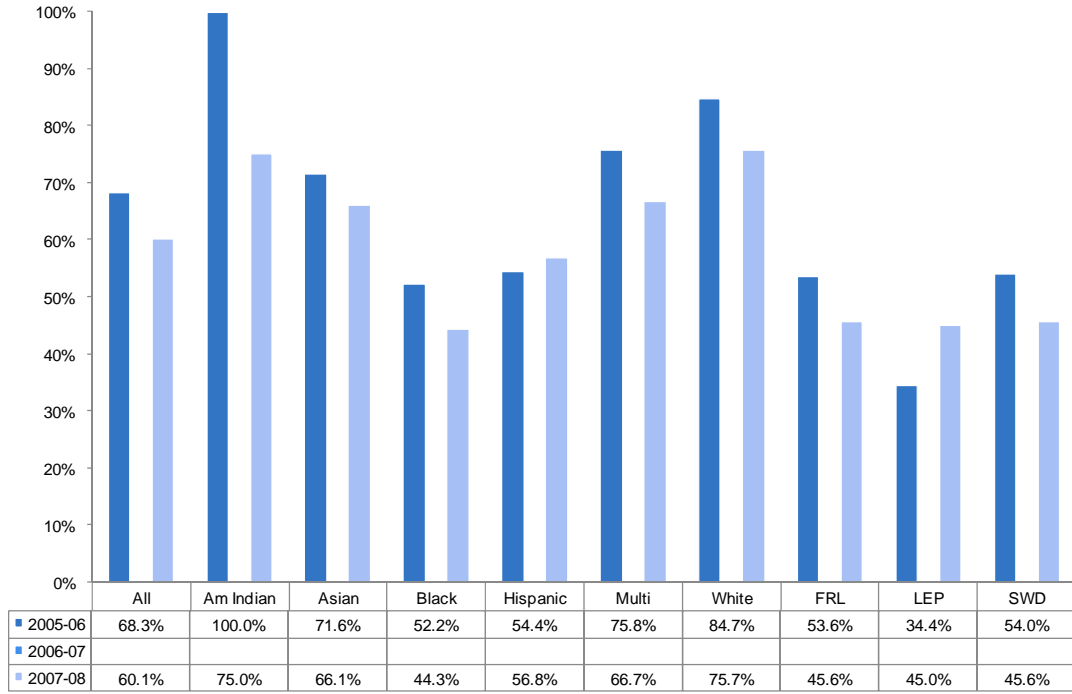
Note: Blanks indicate years that tests were not administered.

**Figure A8**  
**Proficiency Rates Geometry 2005-06 to 2007-08**



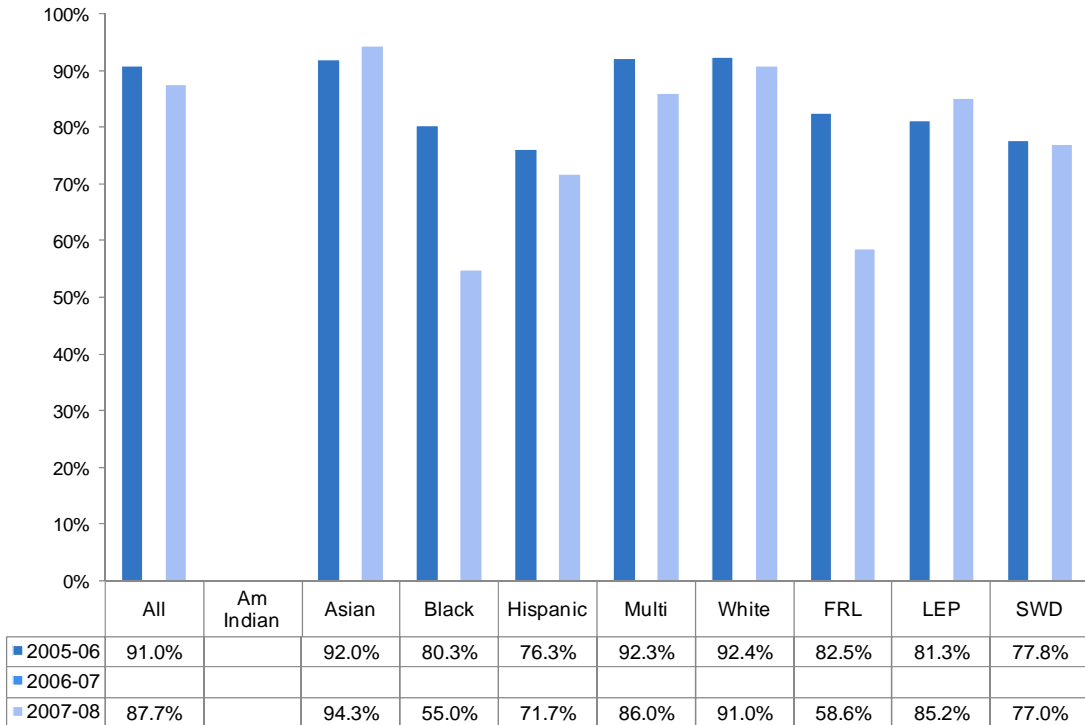
Note: A new Geometry test was introduced in 2006-07.

**Figure A9**  
**Proficiency Rates Physical Science 2005-06 to 2007-08**



Note: Blanks indicate years that tests were not administered.

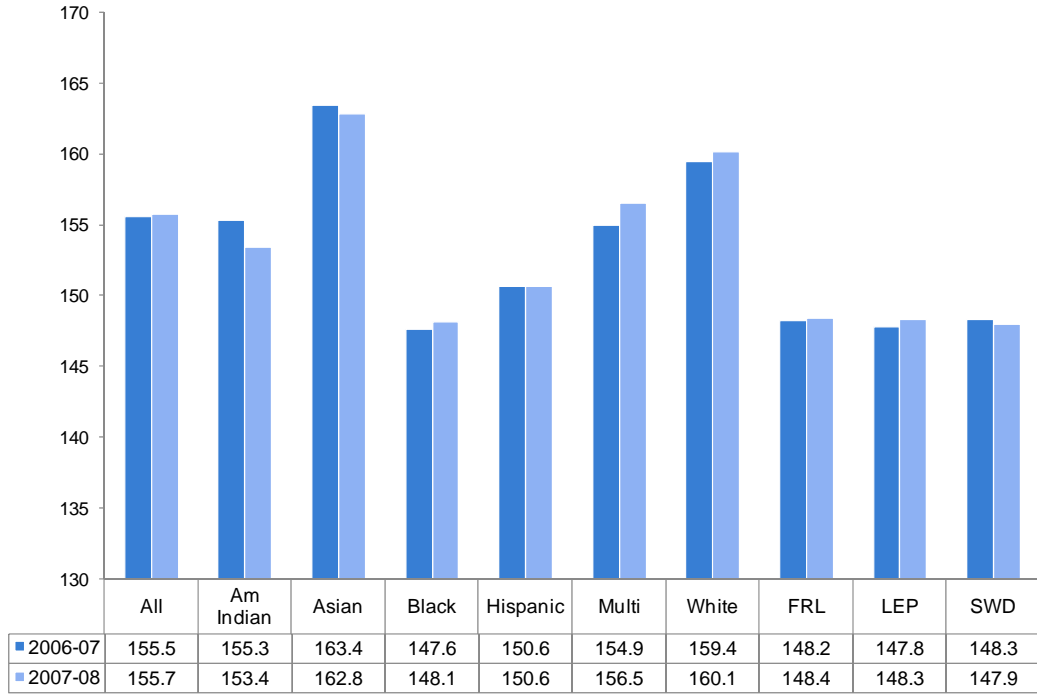
**A10**  
**Proficiency Rates Physics 2005-06 to 2007-08**



Note: Blanks indicate years that tests were not administered.

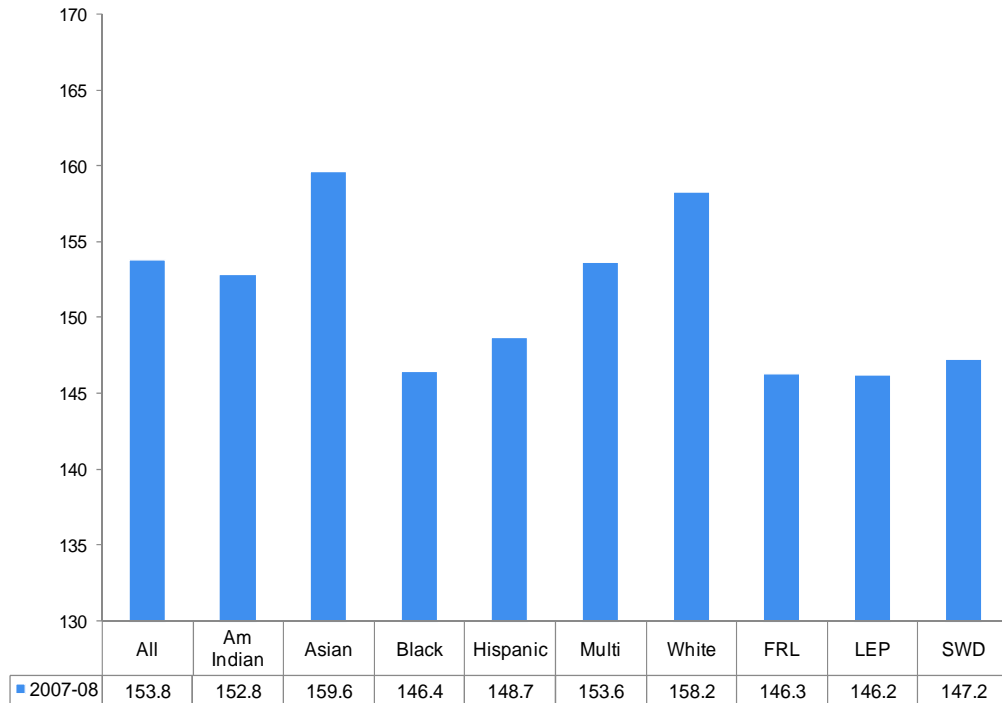
## Appendix B

### Figure B1 End-of-Course Average Scale Scores - Algebra I



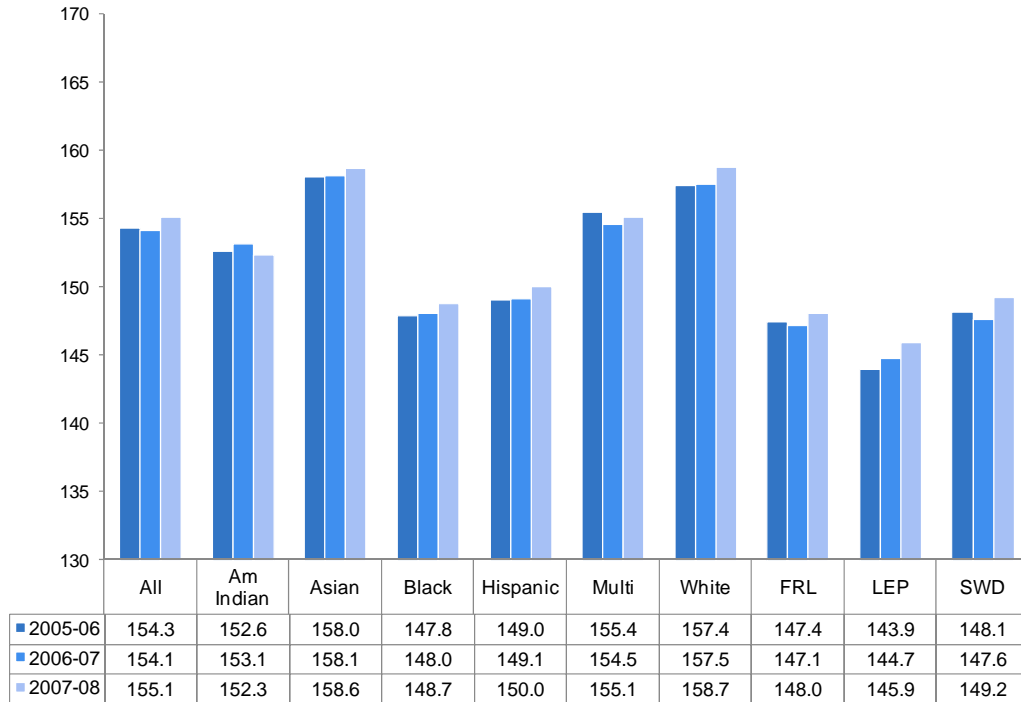
Note: Scale Scores are only provided for test years where the scale did not change.

### Figure B2 End-of-Course Average Scale Scores - Biology



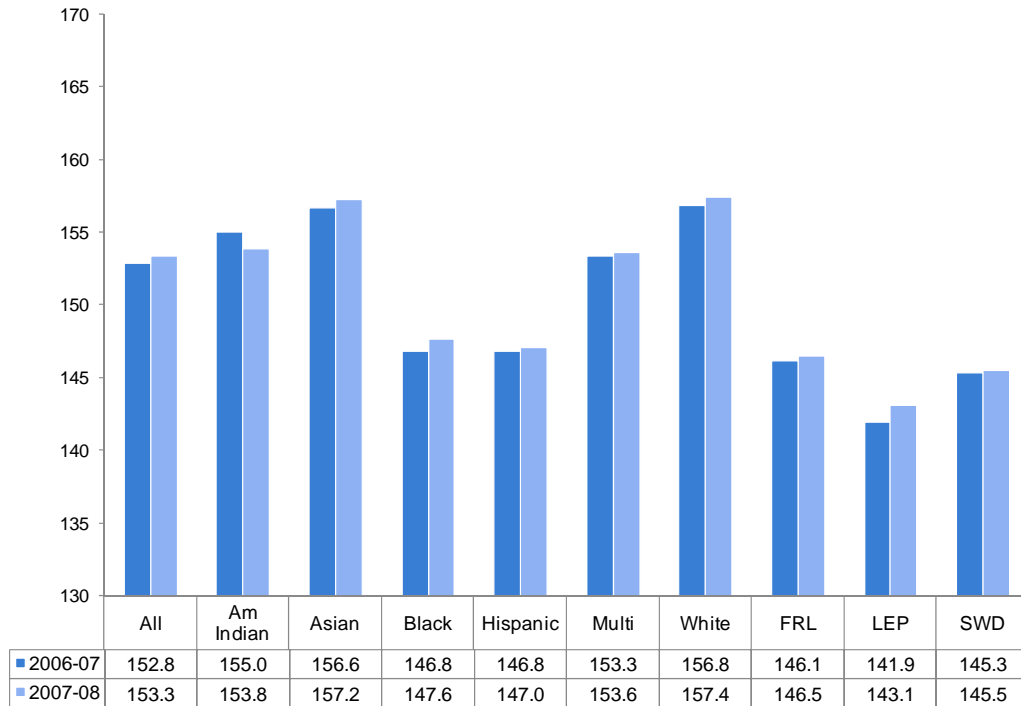
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B3**  
**End-of-Course Average Scale Scores - Civics & Economics**



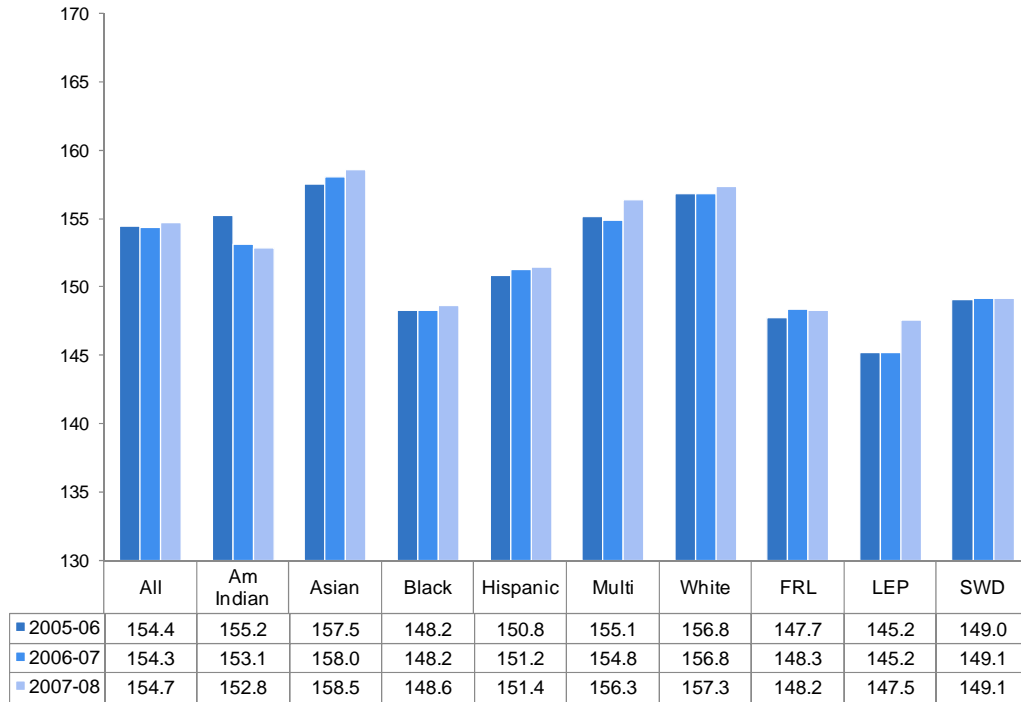
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B4**  
**End-of-Course Average Scale Scores - English I**



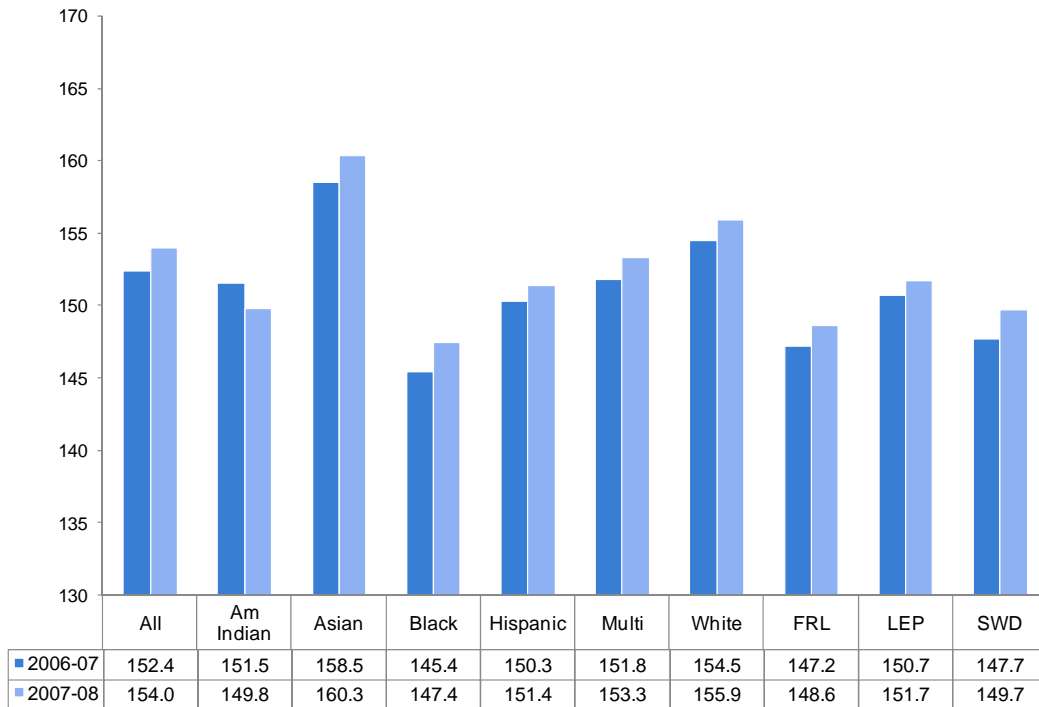
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B5**  
**End-of-Course Average Scale Scores - U.S. History**



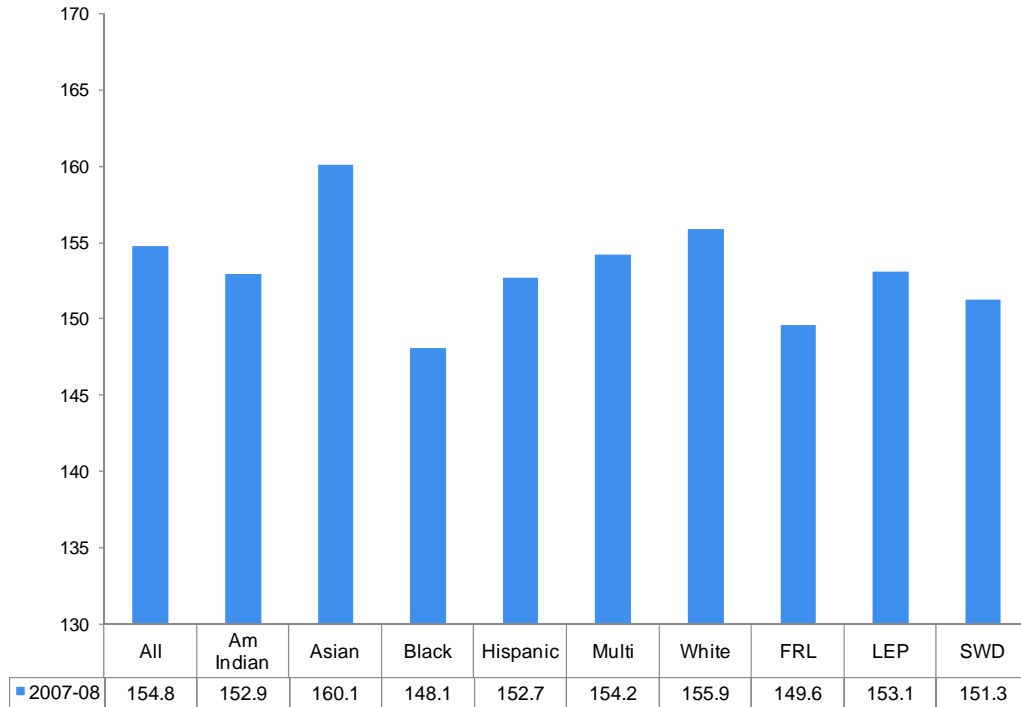
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B6**  
**End-of-Course Average Scale Scores - Algebra II**



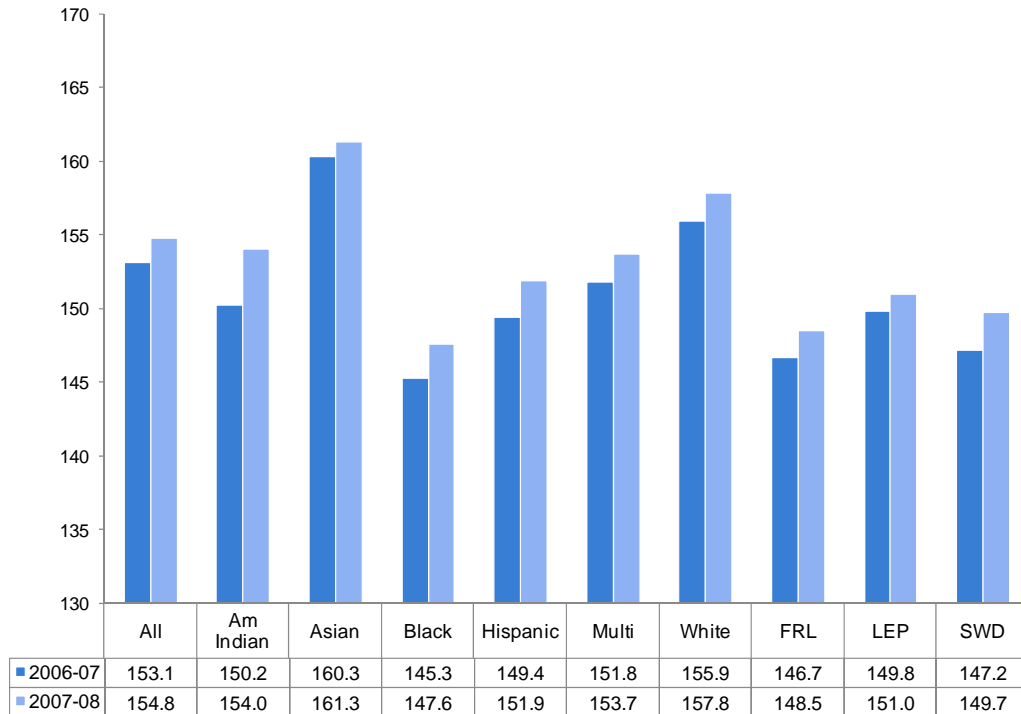
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B7**  
**End-of-Course Average Scale Scores - Chemistry**



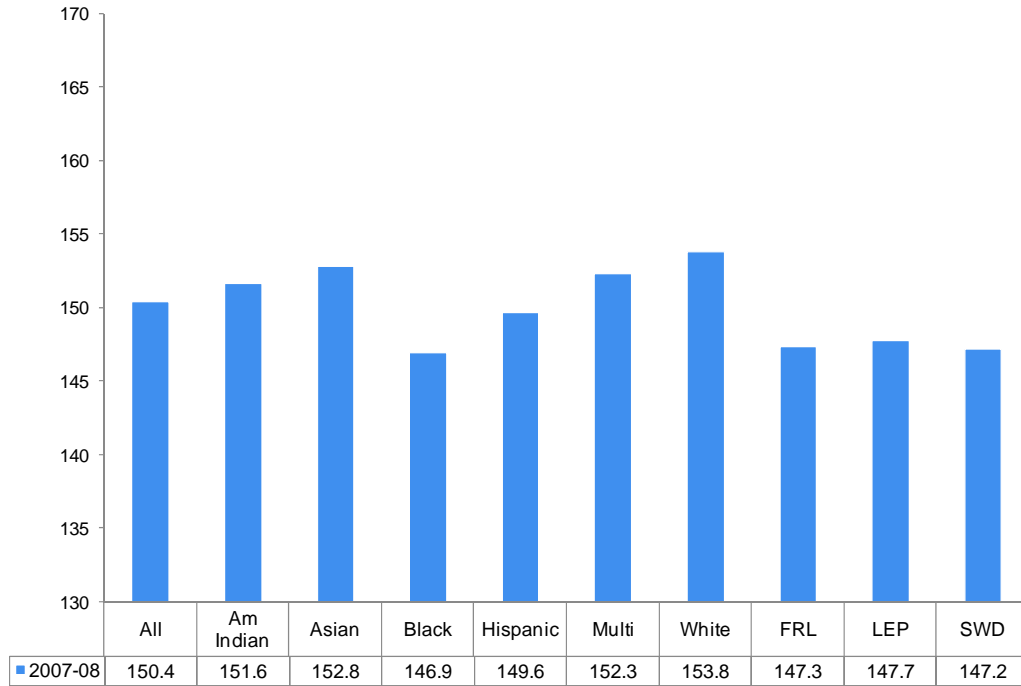
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B8**  
**End-of-Course Average Scale Scores - Geometry**



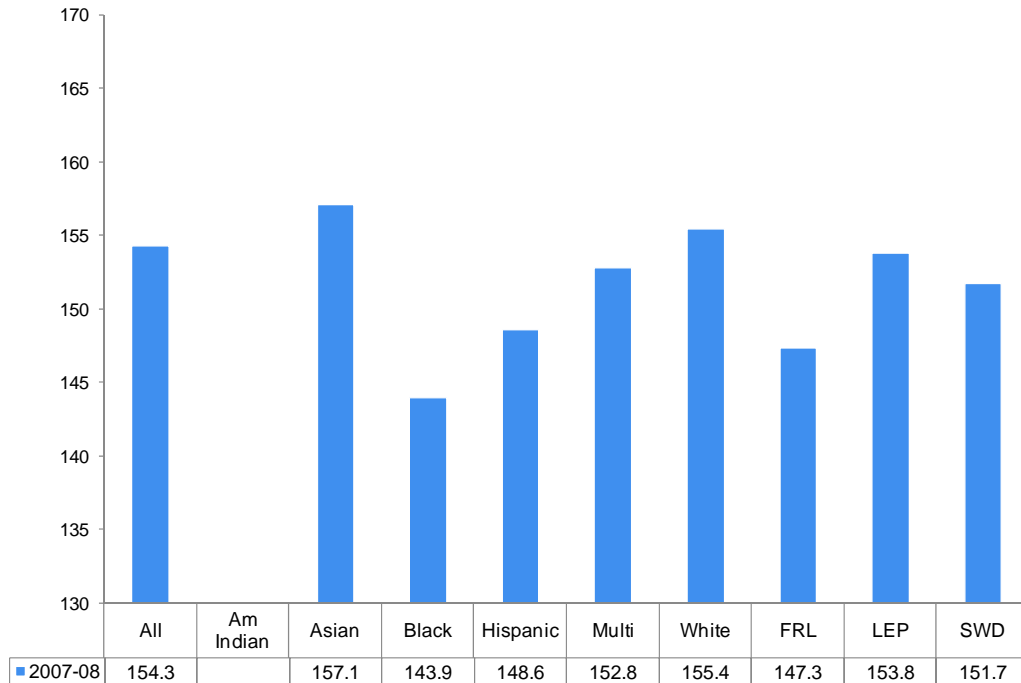
Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B9**  
**End-of-Course Average Scale Scores - Physical Science**



Note: Scale Scores are only provided for test years where the scale did not change.

**Figure B10**  
**End-of-Course Average Scale Scores - Physics**



Note: Scale Scores are only provided for test years where the scale did not change.

The number of American Indian students taking this test was not large enough to report.