



**MIDDLE SCHOOL GRADING:
WAKE COUNTY PUBLIC SCHOOL SYSTEM (WCPSS)
2006-07 and 2007-08**

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ABSTRACT

This study examined the distribution of middle school reading and mathematics grades in 2006-07 and 2007-08 and the correlation of students' classroom grades and End-of-Grade (EOG) scores in 2006-07. Most students (80% or more) received an A, B, or C in reading and mathematics. Among Level IV students, the percentage with an A in the classroom varied by ethnicity. Mathematics grades had a slightly stronger correlation to the newly revised mathematics EOG scores than did reading grades to the 2006-07 reading EOG scores. Middle school grades of A-F had a weaker correlation to EOG scores than that found for standards-based grading and EOG scores at the elementary school level. Schools varied considerably in terms of the percentage of students receiving an A or B who scored at or above grade level on the EOG.

BACKGROUND

In an effort to be competitive in the global labor market, today's students are required to learn an ever-increasing array of information. The large amount of knowledge and number of skills covered by North Carolina's Standard Course of Study represents the desire of educators to prepare students to be competitive on a global scale. However, exactly how students are assessed and graded on this information has been a point of debate for educators. The traditional A-F grading scale requires that students display their knowledge of the state's objectives. However, grades reflect more than a student's knowledge of the Standard Course of Study. In most U.S. classrooms, grades represent an average of a student's performance throughout the class, but the factors that actually go into determining students' grades vary greatly among states, districts, schools, and even classrooms within the same school. Student performance on tests, homework, class participation, projects, and other factors are often combined into a single grade.

The imprecision of grading practices in the U.S. education system has been demonstrated by research showing comparable test results for students from high-poverty

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The author would like to acknowledge the support and intellectual contributions from Nancy Baenen and other Wake County Public School System contributing staff.

schools earning A's and B's while students from more affluent schools earning C's and D's (U.S. Department of Education, 1994). This difference in grading can be the result of differences in standards, assessment difficulty or type, or other practices (such as the weight given to tests, homework, participation, and work habits). The combination of assessment and homework scores provides the opportunity for teacher subjectivity, which may influence a student's grades. This bias is seen as less problematic than not capturing a student's work habits, conduct, ability, and growth.

Although the measurement community has an obligation to identify the technical complexities of measuring and including these factors [work habits and conduct] in grades and of the bias these factors may introduce to grades, we have to recognize that to students, teachers, administrators, and possibly parents, there is considerable face validity to grades that include extraneous factors (Cross & Frary, 1999, p. 59).

While including student work habits in the final grade makes common sense to many, this practice and the subjectivity it introduces into a student's grade often go unexamined. Measurement specialists recommend that grades not incorporate a student's work habits, attitude, effort, and conduct in academic performance and growth. As Cross and Frary (1999, p.58) assert, "if teachers were to embrace grading practices as recommended by most measurement specialists, more valid indicators of academic achievement would result." Given this recommendation why are parents, school administrators, and the general public not calling for reform (Cross & Frary, 1999)? A key factor in this lack of public outcry is an expectation that uniformly high performance in each area will combine to a high overall score and that the student's overall score will be lowered by poor performance in any area (Cross & Frary, 1999). Therefore, parents, teachers, and students accept the idea that work habits are a contributing factor in a student's final grade.

In light of the debate surrounding grading and the inclusion of work habits within students' grades, WCPSS staff plans to examine the grading practices within WCPSS middle schools in 2008-09. This study will provide data to inform those discussions.

RESEARCH QUESTIONS

Both End-of-Grade (EOG) test scores and course grades are measures of students' mastery of the N.C. Standard Course of Study. Of course, EOG exams measure student performance on one occasion under standardized conditions, while grades reflect multiple measures of performance within classrooms. Therefore, they are not expected to be perfectly correlated, but should be moderately correlated. This study explores the distribution of grades assigned to students and the extent to which grades are related/correlated to EOG scores. Key questions addressed include:

1. How is student performance assessed in WCPSS middle schools? What is considered when determining student grades?
2. What is the distribution of grades across grade levels, NCLB groups, and schools?
3. Do students' classroom grades correlate with their EOG level scores?
4. How do classroom grade and EOG score correlations at the middle school level compare to those at the elementary school level?

METHODOLOGY

Data Analysis

The population of this study included students enrolled in WCPSS' 30 middle schools during the 2007-08 academic year. The data used for this study are students' 2006-07 and 2007-08 mathematics and reading grades and students' 2006-07 EOG scores. Descriptive and correlational statistics were used to examine the connection between grades and the N.C. Standard Course of Study. Correlations between grades and EOG scores were based on 2006-07 data, due to the re-setting of cut scores for EOG levels for the 2007-08 reading EOG exam and the resulting delay in the release of the results.

According to North Carolina's Department of Public Instruction (DPI), the EOG tests measure students' performance on the grade-level goals and objectives that are stated in the N.C. Standard Course of Study (North Carolina Testing Program, 2003). Multiple forms of the EOG exams are used during each test administration. While each form of the test represents only a sample of the grade-level objectives within the N.C. Standard Course of Study, the entire curriculum is covered across all of the forms. Given that EOG scores reflect students' knowledge of the N.C. Standard Course of Study, EOG scores were used to measure mastery of the Standard Course of Study and were analyzed to determine the correlation of grades to the Standard Course of Study. Correlations were used to determine the degree to which grades reflect a student's knowledge of the N.C. Standard Course of Study.

Reliability and Validity of EOGs

Both reading and mathematics EOGs have a high degree of reliability and validity (<http://www.ncpublicschools.org/accountability/testing/technicalreports>). Reliability refers to the ability to replicate results under repeated study conditions. The metric used to establish the reliability of North Carolina's EOG and EOC tests of reading and mathematics is an internal consistency coefficient, coefficient alpha. Internal reliability "indicates how close the examinee's obtained score would come to the true score if the test were a perfect measuring instrument" (Charter, 2003, p. 1). Analysis of the 1993 administration of the EOG test forms A, B, & C produced coefficient alpha 0.90 or greater for reading across grades 3-8 (Sanford, 1996). For mathematics the coefficient alpha indices averaged across forms were also high (> 0.94 for grades 3-8). While the 3rd grade pre-test coefficient alpha was 0.82, this test has half of the items of the grade 3 EOG (Bazemore, et al., 2006). Information on the reliability and validity of North Carolina's EOGs can be obtained at the Department of Public Instruction's website (<http://www.ncpublicschools.org/accountability/testing/technicalreports>).

It is important, however, to consider the standard error of measurement when examining individual student level scores. Standard error of measurement is an estimate of the accuracy of a given score on a test using the standard deviation and the reliability of the test. For an individual student, the standard error on the EOG can be quite high. Additional information regarding the standard error of measurement can be found at www.wcpss.net/evaluation-research/reports/2000/mment_error.pdf.

Validity is a characteristic of a test that describes how well a test measures what it is supposed to measure (i.e., the degree to which the EOG tests measure the N.C. Standard Course of Study). North Carolina's EOG tests are curriculum-based tests designed to measure the state's Standard-

Course of Study. North Carolina's curriculum is updated approximately every five years, but the process of creating, field-testing, and administering the exams is continuous (North Carolina Testing Program, 2003). Validity of EOG is measured both in terms of content validity and criterion-related validity. North Carolina teachers write almost all test items and all items are reviewed by at least two teachers. Instructional validity is evaluated by DPI through questionnaires to teachers eliciting feedback on the appropriateness of test content. Criterion-related validity is assessed using Pearson correlation coefficient to measure the association between EOGs and items related to teacher judgment. "The correlation coefficients for the North Carolina EOG and EOC Tests of Mathematics range from 0.49 to 0.89 indicating a moderate to strong correlation between EOG scale scores and its associated variables" (Bazemore, et al., 2006, p. 89). Information on the reliability and validity of North Carolina's EOG tests can be obtained at the Department of Public Instruction's website (<http://www.ncpublicschools.org/accountability/testing/technicalreports>).

Reliability and Validity of Grades

Grades, assessments, and scores should be a valid and reliable representation of a student's performance. "Information from classroom assessments—grades, scores, and judgments about students' work resulting from tests, assignments, projects, and other work—must be meaningful and accurate (that is, valid and reliable)" (Brookhart, 1999, p. iii). The resulting grades should accurately reflect a student's level of achievement (Brookhart, 1999). This goal is easily attained when grading one assignment, but becomes more difficult when the student's grade encompasses multiple assignments (Brookhart, 1999; Winters, 2002). For example, a student who receives 100% on two assignments and a zero on the third assignment will receive a failing (67%) average, even if the student understands the material. Thus, individually the assessments may be valid, but if they are not combined appropriately, they may render an invalid grade (Brookhart, 1999). It is critical that grades "carry real meaning" and accurately reflect this meaning. Reliability refers to consistency of grades across classrooms for similar academic performance. Teachers strive to evaluate their students in a fair manner and provide a reliable assessment of their performance. This study examined the distribution of grades and the correlation of grades and EOG scores to determine both consistency of grading (reliability) within WCPSS schools and the connection of grades to the N.C. Standard Course of Study (validity).

Population Demographics

The population considered in this study includes middle school students enrolled in WCPSS during the 2007-08 school year. Table 1 displays the demographics of students enrolled in 2007-08 as well as the demographics of the subset of middle school students enrolled in 2007-08 who had 2006-07 grade data. The large subset of students with 2006-07 grades is demographically similar to the overall group of students from which they are derived: subgroup percentages all fell within 1% of the WCPSS middle school population. Correlations between grades and EOG scores were conducted on this subset of students.

Table 1
WCPSS Grade 6-8 Students Enrolled in 2007-08
Demographics by Grade Level

| | Grade 6 | | Grade 7 | | Grade 8 | | Total | |
|--------------------------|-------------------|-----------------|-------------------|--------------|-------------------|--------------|-------------------|---------------------|
| | Enrolled in 07-08 | 06-07 grades | Enrolled in 07-08 | 06-07 grades | Enrolled in 07-08 | 06-07 grades | Enrolled in 07-08 | 06-07 grades |
| Asian | 585 | -- ^a | 524 | 444 | 532 | 451 | 1,641 | 895 ^b |
| Black/African Am. | 2,730 | -- ^a | 2,726 | 2,437 | 2,760 | 2,495 | 8,216 | 4,932 ^b |
| American Indian | 28 | -- ^a | 30 | 24 | 30 | 26 | 88 | 50 ^b |
| Hispanic/Latino | 1,105 | -- ^a | 1,005 | 875 | 951 | 835 | 3,061 | 1,710 ^b |
| White | 5,026 | -- ^a | 5,215 | 4,829 | 5,159 | 4,811 | 15,400 | 9,640 ^b |
| Multiracial | 469 | -- ^a | 391 | 350 | 381 | 339 | 1,241 | 689 ^b |
| Total | 9,943 | -- ^a | 9,891 | 8,959 | 9,813 | 8,957 | 29,647 | 17,916 ^b |
| FRL | 3,110 | -- ^a | 2,953 | 2,589 | 2,711 | 2,407 | 8,774 | 4,996 ^b |
| SWD | 1,482 | -- ^a | 1,529 | 1,461 | 1,375 | 1,306 | 4,386 | 2,767 ^b |
| LEP | 747 | -- ^a | 652 | 554 | 584 | 484 | 1,983 | 1,038 ^b |

Data Source: WCPSS Student Locator June 2008 for demographic data and NCWise 2007-08 End-of-Year file for grade data.

Note 1: Students may appear in more than one category: race and FRL, SWD, and/or LEP.

2: Differences in totals reflect students with missing data for one or more variables.

^a 2006-07 data was not included for grade 6 students, as the middle school grade data were limited to a small population of nonrepresentative students retained in grade 6.

^b Totals represent only students enrolled in grades 7 and 8 in 2007-08 with either a reading or mathematics middle school grade in 2006-07.

RESULTS

Question 1: How is student performance assessed in middle school?

At the middle school level, students are assigned grades on an A-F grading scale. Grades comprise a combination of factors, including student knowledge of N.C. Standard Course of Study as measured by classroom homework, tests, and other classroom projects and assessments. Grades may also include work habits and class participation within some classrooms. The exact

combination of factors varies across classrooms and schools. While homework is incorporated into a student's grade at the middle school level, according to WCPSS' Homework Policy, homework should not constitute more than 15% of a student's final grade.

The WCPSS' middle school curriculum guide details the courses required for students at each grade level. For the purposes of this study, students' reading grades included the required Language Arts and Language Arts Adapted courses in grades 6, 7, and 8. Reading grades in Literacy Connection/Writing and Literacy Essentials/Writing were used for those students who took these courses as their primary Language Arts course in 2006-07. Mathematics grades included 6th-Grade Math, Advanced 6th-Grade Math, Compacted 7th and 8th-Grade Math, 7th-Grade Math, Algebra I, 8th-Grade Math, 8th-Grade Math Plus, and Geometry. Math Resource and Math Adapted in grades 6, 7, and 8 and Math Essentials were used for students where these courses were the student's primary mathematics course in 2006-07.

Question 2: What is the distribution of grades across grade levels, NCLB subgroups, and schools?

It is useful to explore grade patterns first without considering EOG scores to establish basic patterns. The degree to which these patterns varied is of interest.

Grade Level

The distribution of grades reflect the recorded 2006-07 and 2007-08 mathematics and reading course grades recorded in NCWise for students enrolled in middle school in 2007-08. Table 2 shows grades— student performance on an A-F grading scale—by grade level in reading and mathematics in 2006-07 and 2007-08.

As depicted in Table 2, A's and B's were the most common grades given. In reading, A's and B's were most common; however, the frequency of A's and B's was fairly close and varied in terms of which was more common by grade and year. In math, B was consistently the most common grade and A was the second most common grade with the exception of grade 8 students, where a C was the second most common grade received.

- The modal (most often occurring) reading grade for the 16,767 students with a valid reading grade in 2006-07 was an A, while for the 27,781 students with a valid reading grade in 2007-08 the modal grade was a B.
- Among students in grades 6-8, the second most common grade in reading and mathematics in 2007-08 was an A.
- While there were some differences by grade level in reading, in 2007-08 the number of students receiving an A versus a B at each grade level was relatively close (only 22 students or less separated the first and second most common grade at each grade level).
- Similar to reading, A's and B's represent the two most common mathematics grades among students in grades 6 and 7 in 2006-07 and 2007-08 and students in grade 8 in 2006-07. However, the difference between the number of students receiving an A (the second most

common grade) and a B (the most common grade) was considerable greater (ranging from 389 to 1,002 students).

- Among grade 8 students, in 2007-08, a B was also the most common grade received; however, the second most common grade received was a C. The difference between the number of students receiving a B and those receiving a C was 934 students.

Table 2
Reading and Mathematics Grades for Students Enrolled in 2007-08
by Grade Level and Year

| Reading Grade | | | | | | | |
|------------------------|---------|-------------------|-------------------|-------------------|-------------------|------------------|--------------------|
| Grade Level 2007-08 | Year | A | B | C | D | F | Total |
| Grade 6 | 2006-07 | -- ^a | -- ^a | -- ^a | -- ^a | -- ^a | -- ^a |
| | 2007-08 | 3134 | 3119 | 1805 | 821 | 374 | 9253 |
| Grade 7 | 2006-07 | 2811 | 2650 | 1557 | 884 | 444 | 8346 |
| | 2007-08 | 2959 | 2968 | 1843 | 977 | 487 | 9234 |
| Grade 8 | 2006-07 | 2739 | 2661 | 1644 | 912 | 465 | 8421 |
| | 2007-08 | 2727 | 2748 | 1955 | 1204 | 660 | 9294 |
| 6-8 Total | 2006-07 | 5550 | 5311 | 3201 | 1796 | 909 | 16767 |
| | 2007-08 | 8820 | 8835 | 5603 | 3002 | 1521 | 27781 |
| Mathematics Grade | | | | | | | |
| Grade 6 | 2006-07 | -- ^a | -- ^a | -- ^a | -- ^a | -- ^a | -- ^a |
| | 2007-08 | 2836 | 3406 | 2155 | 1109 | 432 | 9938 |
| Grade 7 | 2006-07 | 2649 | 3038 | 1885 | 950 | 422 | 8944 |
| | 2007-08 | 2444 | 3446 | 2296 | 1192 | 496 | 9874 |
| Grade 8 | 2006-07 | 2260 | 3106 | 2025 | 1073 | 482 | 8946 |
| | 2007-08 | 2194 | 3291 | 2357 | 1392 | 550 | 9784 |
| 6-8 Total | 2006-07 | 4909 ^b | 6144 ^b | 3910 ^b | 2023 ^b | 904 ^b | 17890 ^b |
| | 2007-08 | 7474 | 10143 | 6808 | 3693 | 1478 | 29596 |

Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 and 2007-08 grade data.

Note: **Blue** font indicates the most common performance level within a grade level.

Purple font indicates the second most common performance level within a grade level.

^a 2006-07 data were not included for grade 6 students since the middle school grade data was limited to a small population of nonrepresentative students retained in grade 6.

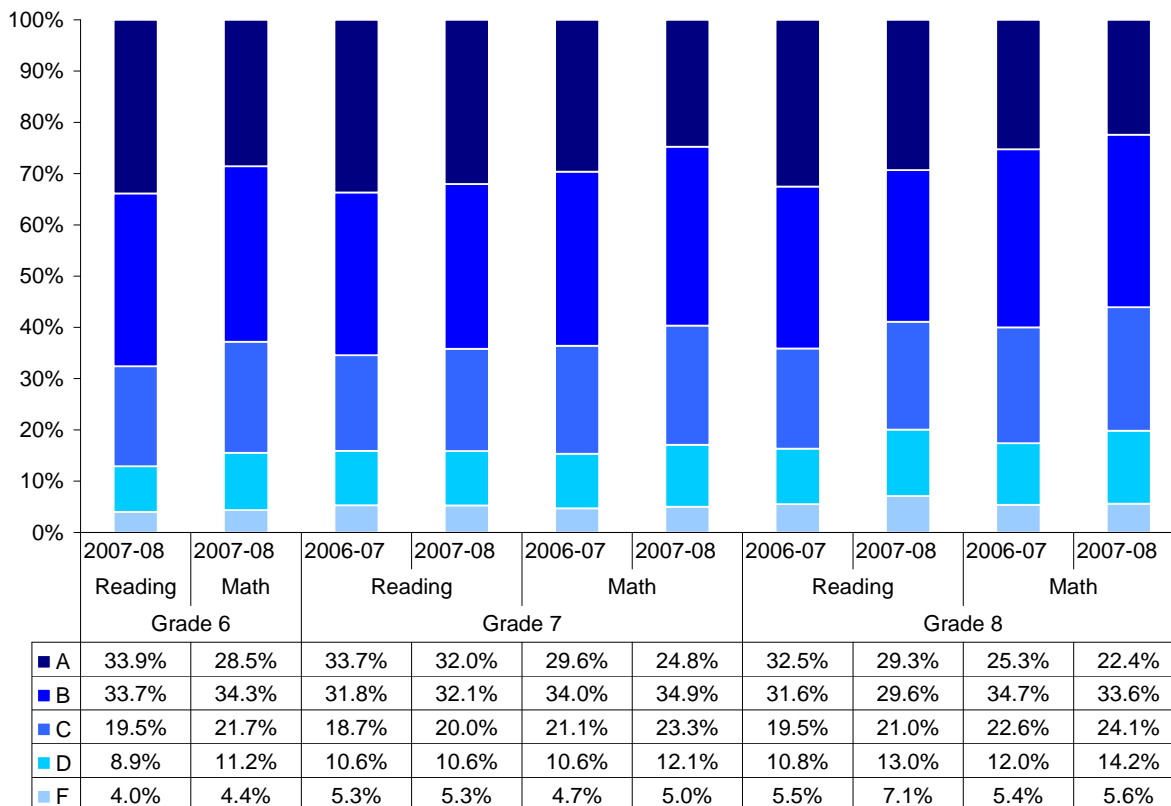
^b Totals represent only students enrolled in grade 7 and 8 in 2007-08 with middle school grades in 2006-07.

Figure 1 displays the distribution of classroom grades by grade level for reading and mathematics in terms of percentages in 2006-07 and 2007-08. The pattern of student grades was relatively consistent across grade levels and subjects. For example, the percentage of students who received a reading grade reflecting mastery of grade level material (A, B or C) was relatively consistent across the middle school grades (ranging from 80%-87%). However, there were some interesting differences by grade level. Students in the 6th-grade were more likely to

have a reading or mathematics grade of A than were grade 8 students. While an A was a common grade with approximately one-quarter to one-third of students receiving an A, at each grade level a higher percentage of students received an A in reading than in mathematics. Additionally, while the percentage of students who received an F was relatively low, ranging from 4% to 7%, it should be noted that only about one percent of students at the middle school level were retained in 2006-07 (lower than the retention rates at the elementary or high school levels).

- The percentage of students with an A in 2007-08 in reading varied by grade level, from 29% of students in grade 8 to approximately 33% of students in grades 6 and 7; in mathematics, the percentage ranged from 22% in grade 8 to almost 29% in grade 6.
- There was slightly less variation among students receiving a B. Approximately one-third of students received a B in reading and mathematics, ranging from 30% of grade 8 students in reading to 35% of grade 7 students in mathematics.
- In reading, approximately one-fifth of students in grades 6-8 received a C, while 22% to 24% students received a C in mathematics.
- Fewer students received a D, ranging from 9% to 13% in reading and 11% to 14% in mathematics across grades and years.
- There was little variation in the percentage of students receiving an F by subject and grade level. In reading, the percentage of students with an F ranged from 4% of students in grade 6 to 7% of students in grade 8; in mathematics percentages ranged from 4% of students in grade 6 to 6% in grade 8.

Figure 1
Percentage of Students Enrolled in 2007-08
by Grade Level and Reading and Mathematics Grade



Data Source: NCWise 2007-08 End-of-Year Data file for 2007-08 grade data.

Note: 2006-07 data was not included for grade 6 students since the middle school grade data were limited to a small population of nonrepresentative students retained in grade 6.

Interpretation Example: Among grade 6 students in reading, 33.9% received an A, 33.7% received a B, and 19.5% received a C; thus, 12.9% of grade 6 students received a D or F in reading.

Ethnicity and Academic Risk Factors

Both grades and EOG scores vary considerably by ethnicity. This could be related to classroom performance and student ability, but behavior, homework, expectations, and other factors may also play a part. The percentage of students receiving grades of A, B, or C in reading varied greatly by ethnicity and slightly by academic risk factors (LEP, FRL, or SWD). While there were slight variation in the percentage of students receiving each grade from 2006-07 to 2007-08, the overall patterns remained consistent.

- While 95% of Asian students received an A, B, or C, only 70% of Black/African American students received an A, B, or C. In fact, more than half of Asian students received an A (57% in reading and 53% in mathematics), while only a small fraction of Black/African American students received an A (13% in reading and 10% in mathematics).
- In 2007-08, among students with academic risk factors, the percentage of student who received an A, B, or C in reading and mathematics ranged from 67% to 71% (15% or less

received an A). While the variation across risk groups was small, all percentages are lower than the 80-87% of students in each middle school grade who received an A, B, or C (see Figure 1).

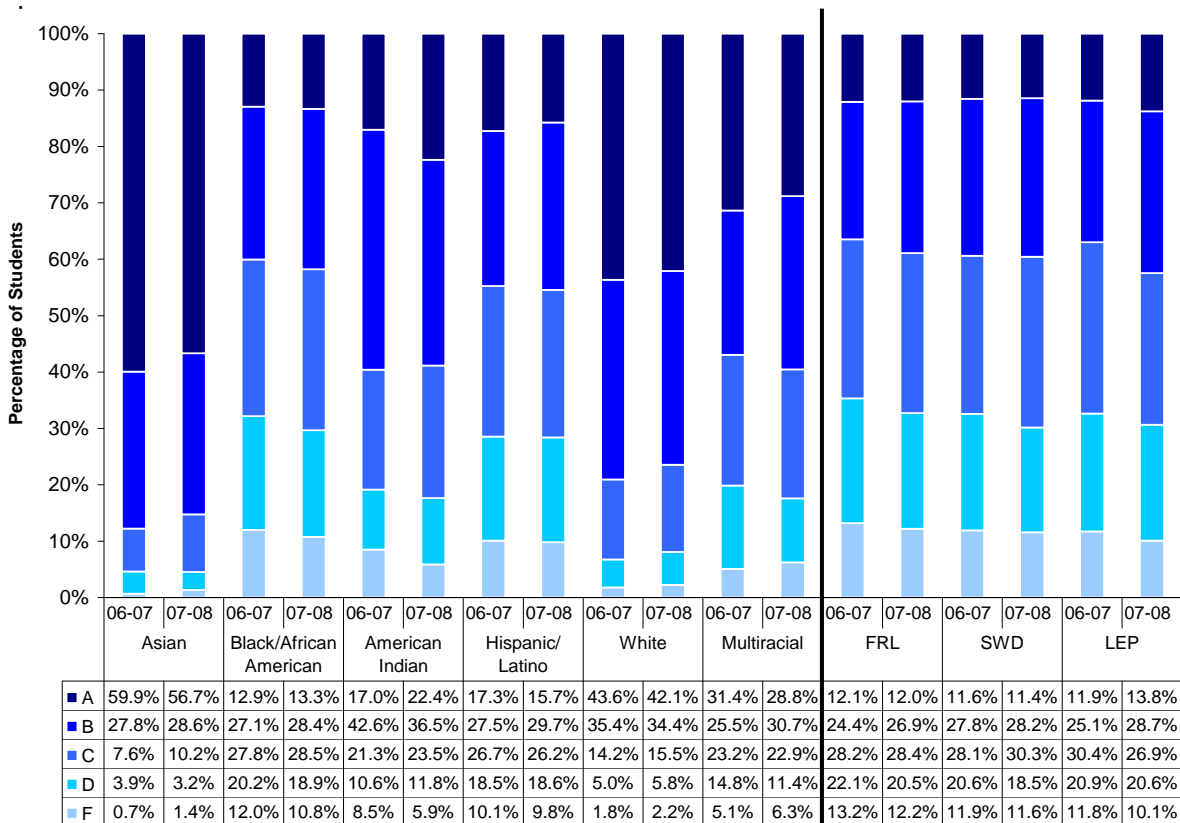
In reading, the distribution of grades in 2006-07 and 2007-08 varied more by ethnicity than risk factor (see Figure 2).

- In 2007-08, the percentage of students with an A in reading varied greatly by ethnicity, from 13% of Black/African American students to more than 57% of Asian students. For students with a risk factor, the percentage of A's was low and varied only slightly, from 11% of students with disabilities (SWD) to 14 % of limited English proficient (LEP) students.
- Among students who received a B the percentage varied by ethnicity, from 28% of Black/African American students to 37% of American Indian students. For students with a risk factor, the percentage of B's varied only from 27% of Free or Reduced-Price Lunch (FRL) students to 28.7% of LEP students.
- In reading, students who received a C, ranged by ethnicity from 10% of Asian students to 29% of Black/African American students. While for students with a risk factor, the range was narrow, from 27% of LEP students to 30% of SWD students.
- Students who received a D ranged from only 3% of Asian students to 19% of Black/African American students and from 19% of SWD students to 21% of FRL and LEP students.
- The percentage of students with an F ranged from 1% of Asian students to 11% of Black/African American students and from 10% of LEP students to 12% of FRL students.

Modal (most common) grades also varied by ethnicity and risk factor.

- Among Asian and White students A was the modal grade in 2006-07 and 2007-08.
- For American Indian and Hispanic/Latino students, B was the mode both years.
- For Black/African American, FRL, and SWD students, the mode was C for both years.
- Among Multiracial students, the mode was an A in 2006-07 and a B in 2007-08.
- For LEP students the mode was C in 2006-07 and B in 2007-08.

Figure 2
Percentage of Students Enrolled in 2007-08
by Subgroup and Classroom Grade in Reading



Data Source: WCPSS Student Locator June 2008 and NCWise 2007-08 End-of-Year Data file for 2007-08 grade data.

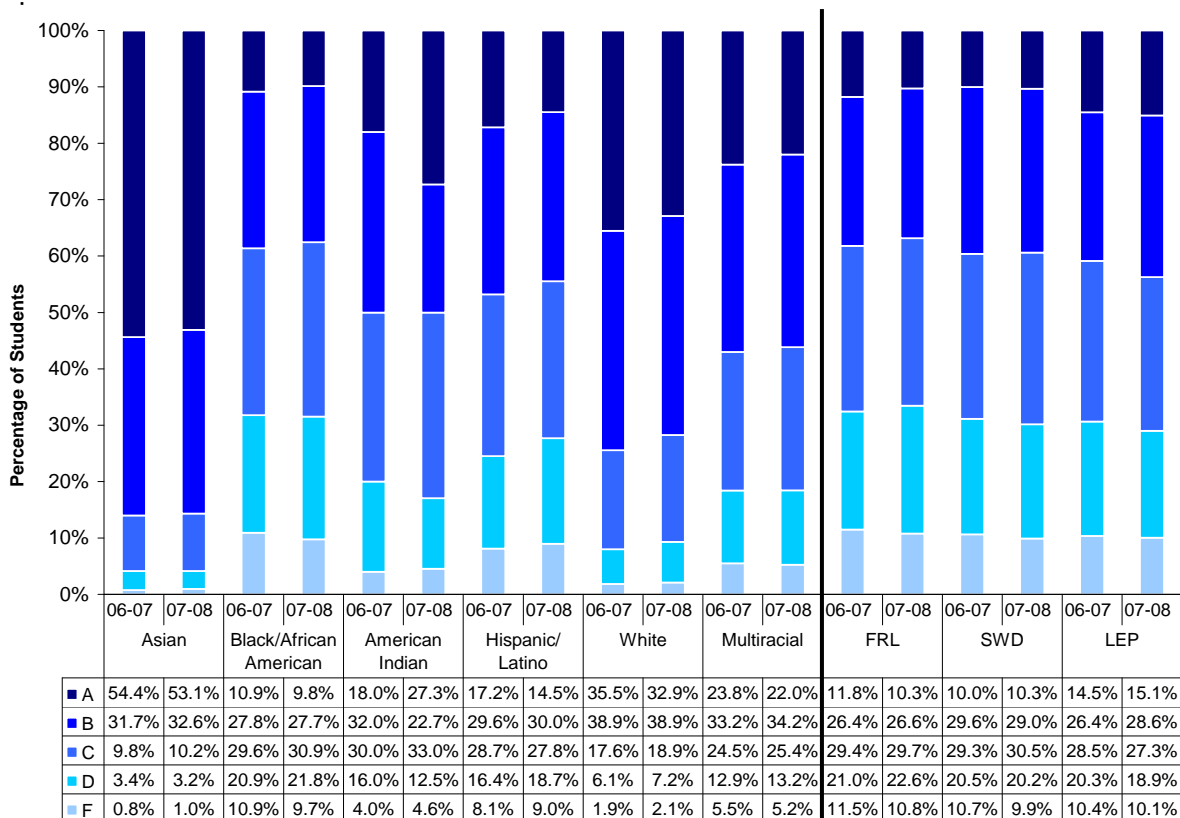
Interpretation Example: In 2007-08, 13.8% of LEP students received an A in reading, compared to 11.4% of SWD students.

In mathematics, as shown in Figure 3, the distribution of mathematics grades in 2006-07 and 2007-08 also varied by ethnicity and less so by risk factor. Patterns in mathematics were similar to reading.

- The percentage of students with an A in reading varied by ethnicity from 9.8% of Black/African American students to 53.1% of Asian students and by academic risk factor from approximately 10.3% of FRL and SWD students to 15.1% of LEP students.
- Among students who received a B the percentage varied by ethnicity from 23% of American Indian students to 39% of White students. For students with a risk factor the range was from 26.6% FRL to 29.0% of SWD students.
- Students who received a C, ranged by ethnicity from 10% of Asian students to 33% of American Indian students and by risk factor from 27.3% of LEP students to 30.5% of SWD students.

- Students who received a D ranged by ethnicity from only 3.2% of Asian students to 21.8% Black/African American students and by risk factor from 18.9% of LEP students to 22.6% of FRL students.
- The percentage of students receiving an F had the least amount of variation by ethnicity and risk factors. By ethnicity, the percentage of students with an F ranged from 1% of Asian students to 9.7% of Black/African American students. Among FRL, SWD, and LEP students approximately 10% received an F.

Figure 3
Percentage of Students Enrolled in 2007-08
by Subgroup and Classroom Grade in Mathematics



Data Source: WCPSS Student Locator June 2008 and NCWise 2007-08 End-of-Year Data file for 2007-08 grade data.

Interpretation Example: In 2007-08, 15.1% of LEP students received an A in mathematics compared to 10.3% of FRL and SWD students.

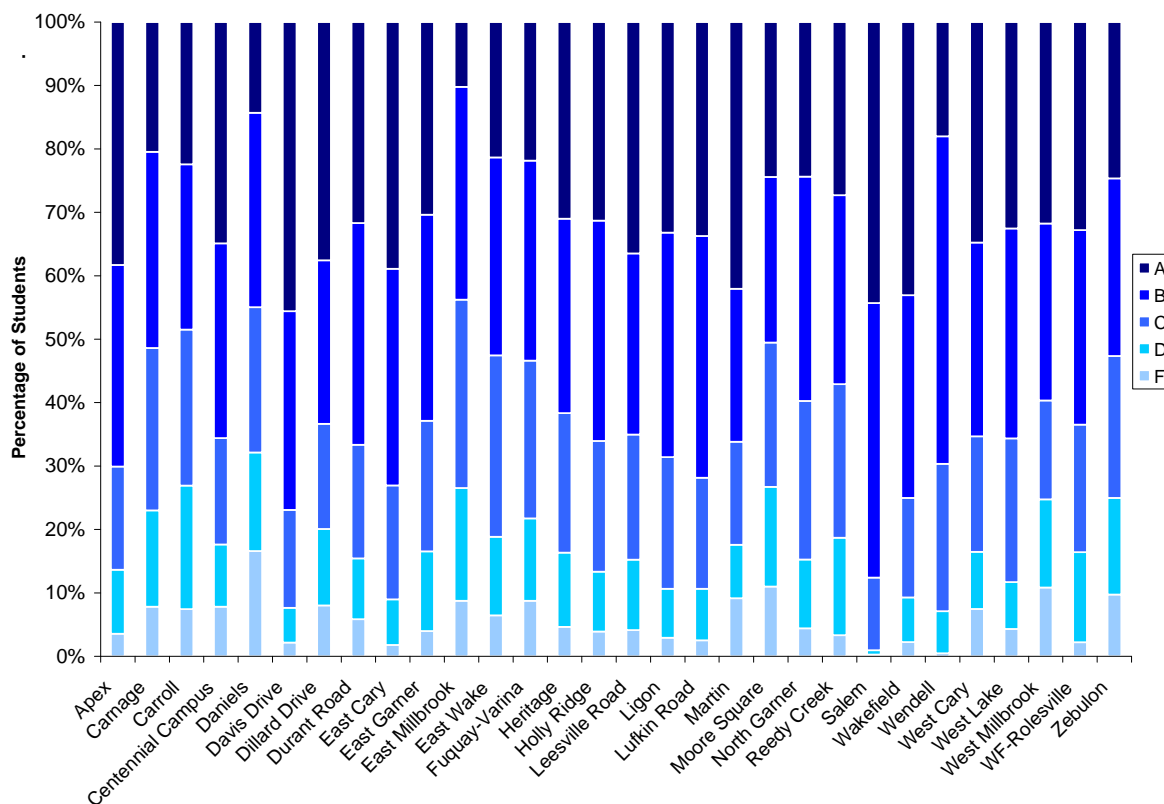
School

Among 30 WCPSS middle schools in 2007-08, the percentage of students with an A-F for their reading and mathematics grade varied by school. Figure 4 displays reading and Figure 5 displays mathematics grades in 2007-08 by middle school.

In reading, the percentage of students receiving an A-F reading grade varied by school ranging from:

- 10.2% to 45.6% of students who received an A,
- 24.1% to 51.7% of students who received a B,
- 11.4% to 29.7% of students who received a C,
- Fewer than 1% to 19.5% of students who received a D, and
- Fewer than 1% to 16.7% of students who received a F.

Figure 4
Percentage of Students by School and Grade in Reading 2007-08



Data Source: WCPSS Student Locator June 2008 and NCWise 2007-08 End-of-Year Data file for 2007-08 grade data.

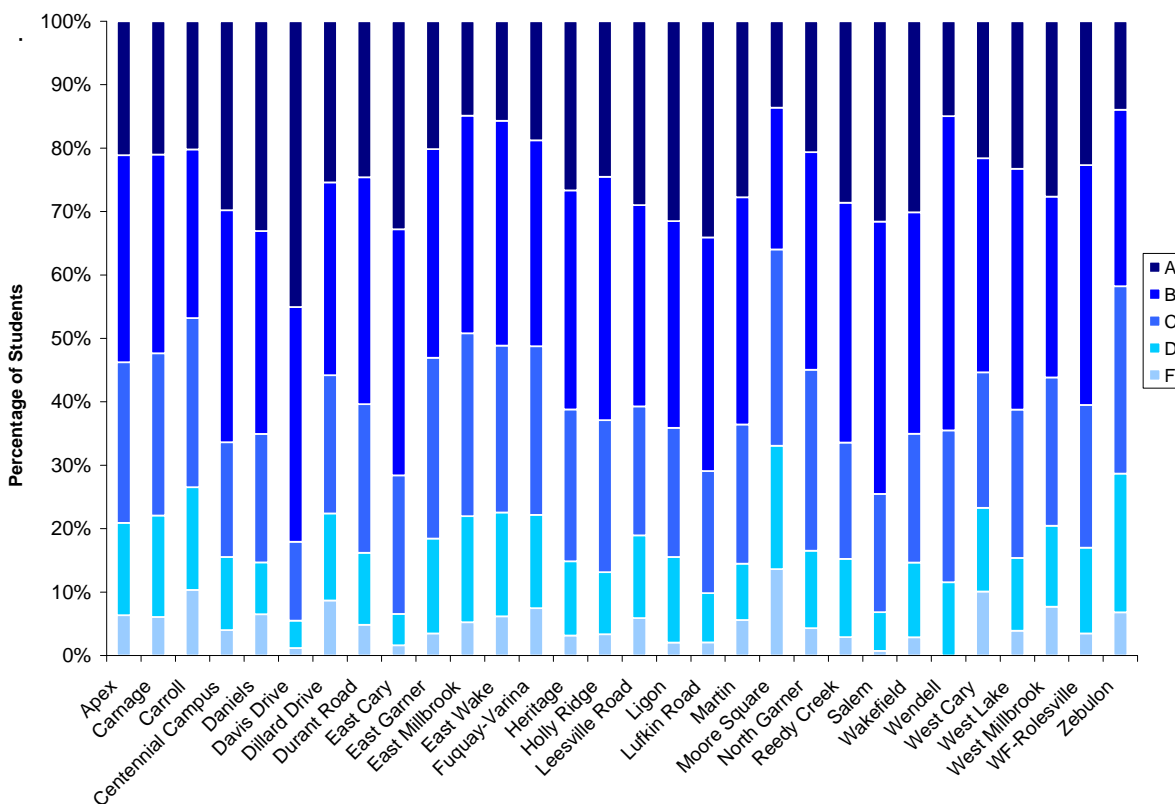
Interpretation Example: In 2007-08 31.8% of students at West Millbrook Middle had an A in reading, while only 10.2% of students at East Millbrook Middle had an A.

In mathematics, the percentage of students who received an A-F mathematics grade also varied by school, ranging from:

- 13.6% to 45.1% of students who received an A,
- 22.4% to 49.6% of students who received a B,
- 12.5% to 31.0% of students who received a C,
- 4.3% to 21.9% of students who received a D, and
- 0% to 13.6% of students who received a F.

Variations by school may be due to real differences in performance or differences in applying standards. One notable pattern was that for both reading and mathematics, the percentages of students receiving an A had the greatest range across schools (36 and 31 percentage points, respectively). School differences of 30 percentage points or more seem larger than expected, and may deserve further study, especially in light of a similar finding for elementary schools in the percentage of student receiving a level 4 (the highest grade for the elementary school level). Additional information on elementary school grading practices is available within the *Standards-Based Grading 2005-06 and 2006-07 report* (http://www.wcpss.net/evaluation-research/reports/report_topics/other_policy_eval.html).

Figure 5
Percentage of Students by School and
Grade in Mathematics 2007-08



Data Source: WCPSS Student Locator June 2008 and NCWise 2007-08 End-of-Year Data file for 2007-08 grade data.

Interpretation Example: In 2007-08, 45.1% of students at Davis Drive Middle and 32.5% of students at Ligon Middle had an A in mathematics.

Another way of examining the variation in grades among schools is to consider the percentage of students receiving an A or B in the classroom and the percentage of students with a Level III or IV EOG score (see Appendixes A and B). The comparison between classroom grades and EOG scores were based on 2006-07 data, due to the re-setting of cut scores for EOG levels for the 2007-08 reading EOG exam and the resulting delay in the release of the results.

Both the percentage of students with a Level III or IV and the percentage of students with an A or B varied considerably by school. While some variation can be expected across schools serving students with varying needs, grading practices may be a factor. The fact that, across schools there was considerable variance in the difference between these two percentages is of interest. For example, in reading 84% of students received a Level III or IV on the EOG at both West Millbrook Middle and East Garner Middle; however, 69% of students received an A or B at West Millbrook (a 15 percentage point difference) while only 46% received an A or B at East Garner (a 38 percentage point difference).

- The percentage of students with an A or B in reading ranged by school from 43% to 91% and the percentage of students with a Level III or IV ranged from 81% to 98% of students.
- The percentage of students with an A or B in mathematics ranged by school from 43% to 82% and the percentage of students with an EOG score of Level III or IV ranged from 55% to 97% of students.
- In reading and mathematics, the vast majority of schools the percentage of students with a Level III or IV was higher than the percentage with an A or B in the classroom.
- The percentage point difference between the percentages of students who earned an A or B and the percentage at Level III or IV varied from 7 to 44 percentage points for reading and from 1 to 25 percentage points for mathematics.
- Only two middle schools had a greater percentage of students earning an A or B in mathematics than the percentage of students with a Level III or IV on the mathematics EOG.
- Among all middle schools the percentage of students with a Level III or IV was higher than the percentage of students with an A or B.

While classroom grades were not formally designed to match the EOG scores, both measure students' knowledge of subject material. Thus, a fairly high correlation between grades and EOG scores should be present across schools. Large variations in the percentage point difference between the percentage of students with an A or B and the percentage with a Level III or IV should generate questions regarding the consistency of grading across schools.

Question 3: Are students' classroom grades correlated with their End-of-Grade (EOG) scores?

Reading EOG scores for 2007-08 were not available at the time of the publication of this report because of the re-setting of cut scores for EOG levels for the revised 2007-08 test; thus, in order to capture reading and mathematics correlations for the same year, the correlations between

grades and EOG scores are based on 2006-07 data. The correlation coefficient demonstrates how well the two variables are correlated: closer to 1 denotes a more linear relationship while closer to 0 denotes little or no relationship. Additionally, Algebra I, Algebra II, and Geometry were excluded from the mathematics grades. These courses have End-of-Course exams associated with them and therefore correlations to the EOG were not conducted.

While the correlation between Algebra I and the Algebra End-of-Course (EOC) are beyond the scope of this study, Appendix C displays the distribution of grades by ethnicity and EOC level (Haynie, 2008). Similar patterns of ethnic differences were found among students with Algebra EOC levels as were found within mathematics EOG levels. The graph is helpful in exploring finer gradations of scores within levels as well.

Two correlations were run to assess the relationship between grades and EOG level and grades and EOG scale scores. A Spearman's rho was computed to evaluate the relationship between EOG level and grade. The correlation between grades and EOG levels provides a less precise estimate of the relationship since student scores are collapsed into only four levels. In order to establish a more precise measure of the correlation between EOG scores and grade, a Pearson correlation was computed to evaluate the relationship between EOG scale scores and students' grades. Both correlations revealed a positive relationship exists between EOG scores and grades. While the pattern remained constant for both correlations, the correlation between scale score and grade (the finer measure) was stronger for all grade levels in mathematics and reading (see Table 3 for results of the correlation analysis).

As shown in Table 3, while moderate correlations were found between mathematics and reading scores and EOG scores, students' mathematics grades had a higher correlation to their mathematics EOG (>.57) than their reading grade did to the reading EOG (>.49).

Table 3
Correlation of Grade and EOG for Students Enrolled in 2007-08
by Grade Level in 2006-07

| | Grade Level in 2006-07 | EOG Level (Spearman's rho) | Number of Students w/ EOG Level | EOG Scale Score (Pearson) | Number of Students w/ EOG Scale Score |
|--------------------------|-------------------------------|-----------------------------------|--|----------------------------------|--|
| Reading Grade | 6 | .54 | n=8209 | .58 | n=8150 |
| | 7 | .49 | n=8260 | .54 | n=8204 |
| Mathematics Grade | 6 | .58 | n=8651 | .61 | n=8651 |
| | 7 | .57 | n=8421 | .60 | n=8421 |

Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Note: Correlations were done using 2006-07 grade and EOG data for students enrolled in grades 7 and 8 during the 2007-08 school year due to the availability of EOG data.

Interpretation Example: In grade 6 students' mathematics grade had a slightly higher correlation to their mathematics EOG (0.58 EOG level/ 0.61 EOG scale score) than their reading grade did to the reading EOG (0.54 EOG level / 0.58 EOG scale score).

Mathematics grades had a slightly stronger correlation to the newly revised mathematics EOG than did reading grades to the current reading EOG. The stronger correlation between mathematics grades and EOG scores suggests that the newly revised EOG is a better match to what our students are expected to know within the classroom. These findings were similar to the findings at the elementary school level. For additional information on elementary school grading results, see the Standards-Based Grading 2005-06 and 2006-07 report (E&R Report No. 08.12). In 2007-08, the reading EOG was revised. Checking the correlation of reading grades with the revised reading EOG could be helpful in determining whether the correlation between the two measures of students' knowledge of the North Carolina's Standard Course of Study improves.

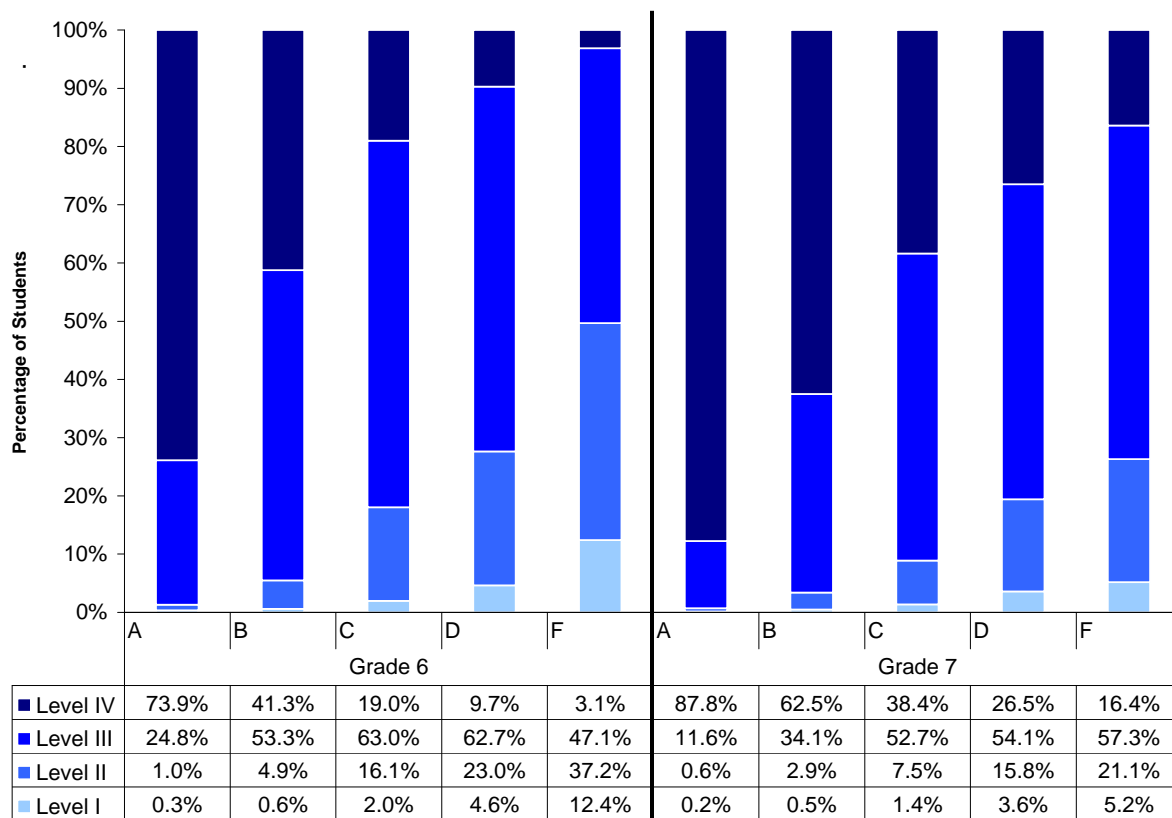
A-F Grade

Figures 6 and 7 display the percentage of students who received an A-F grade by EOG level. For reading, an examination of the percentage of students at or above grade level by classroom grade received revealed that the vast majority (>82% of grade 6 students and >91% of grade 7 students) of students who had an A, B, or C in the classroom were also at or above grade level on their EOG (see Figure 6). However, for students who had a D or F in reading, the percentage that scored proficient on the EOG ranged by grade level from 50% to 81%. Thus, while a student performing on grade level in reading within the classroom was highly likely to be successful on the EOG the reverse is not the case. In fact, of students performing below grade level within the classroom, half to more than 80% were successful on the EOG.

Although the performance level within the classroom and EOG levels were not intended to have a one-to-one correspondence, the fact that 50% at grade 6 and nearly three fourths (>73%) of grade 7 students with an F scored at or above grade level on their EOG, may indicate that classroom teachers have grading practices that are more stringent than the EOG standards.

- Almost all students (>98%) of students with an A scored a Level III or IV on their EOG in grades 6 and 7 (74% of grade 6 students and 88% of grade 7 students scored a Level IV).
- Almost all students (95% in grade 6 and 97% in grade 7) with a B grade in reading scored at or above grade level.
- Of students with a reading grade of C, the vast majority (82% of grade 6 and 91% of grade 7 students) were on grade level, scoring a Level III or IV on their reading EOG.
- Among students with a reading grade of D, 72% in grade 6 and 81% in grade 7 scored at or above grade level on their reading EOG.
- Of students with an F reading grade, only 5% of grade 7 and 12% of grade 6 students scored a Level I on their reading EOG while 50% of grade 6 and 74% of grade 7 students were at or above grade level.

Figure 6
Percentage of Students Enrolled in 2007-08 by
2006-07 Reading Grade and Reading EOG Level



Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Note: Grade level refers to grade level in 2006-07 for students enrolled in 2007-08.

Interpretation Example: Among grade 7 students who had an A, 87.8% scored a Level IV and 11.6% scored a Level III on the reading EOG.

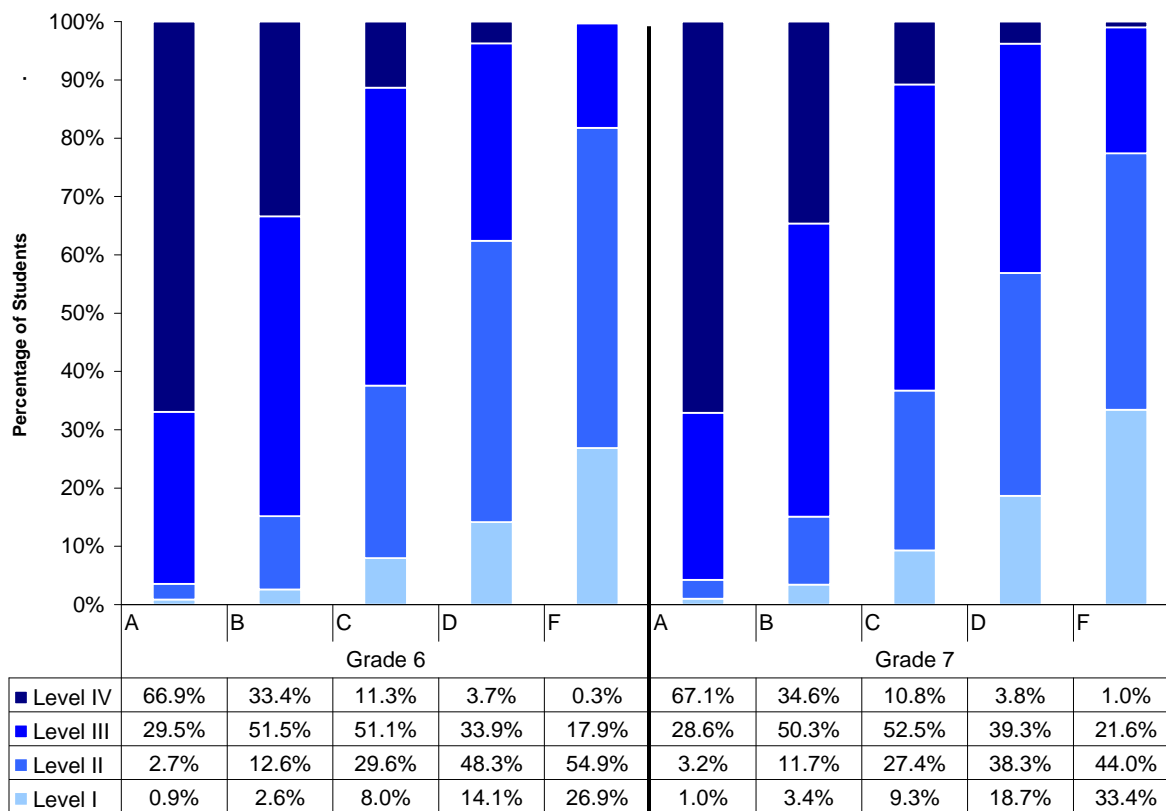
While for mathematics the majority (>62%) of students who had an A, B, or C in the classroom were also at or above grade level on their EOG (see Figure 7), this was considerably lower than found in reading (>82%). For students who had a D or F in mathematics, the percentage that scored proficient on the EOG ranged by grade level from 18% to 43%. Students performing with an A or B in mathematics were highly likely to be successful on the EOG (>85%). However, for students performing below grade level within the classroom, the percentage who were successful on the EOG ranged from 18% to 43% which was much lower than the range (50% to 81%) found for reading. These findings reiterate the closer match found between mathematics grades and EOG scores.

- Similar to reading results, the vast majority (>84%) of students receiving an A or B in mathematics were at or above grade level based on their EOG score; only 63% of students who earned a C in mathematics were at or above grade level on the mathematic EOG.
- Unlike reading, students with a F in mathematics were considerably less likely to be on grade level based on the EOG (18% of grade 6 and 23% of grade 7) as compared to the larger

percentage (50% of grade 6 and 73% of grade 7) of students unsuccessful within the classroom who scored on grade level scoring a Level III or IV on their reading EOG.

- The vast majority (>95%) of students with an A mathematics grade scored Level III or IV with the majority scoring Level IV on their mathematics EOG.
- The vast majority (85%) of students with a B mathematics grade scored at or above grade level, with most scoring Level III on their mathematics EOG.
- Of students with a C mathematics grade, the majority (>62%) scored at or above grade level on their mathematics EOG, with the most scoring a Level III.
- Among students with a D in mathematics, approximately 48% of grade 6 and 38% of grade 7 students scored a Level II on their mathematics EOG.
- Most (>77%) of students with an F mathematics grade scored below grade level on their mathematics EOG.

Figure 7
Percentage of Students Enrolled in 2007-08 by
2006-07 Mathematics Grade and Mathematics EOG Level



Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Note: Grade level refers to grade level in 2006-07 for students enrolled in 2007-08.

Interpretation Example: Among grade 6 students who had an A, 66.9% scored a Level IV and 29.5% scored a Level III on the mathematics EOG.

EOG Level

Another way of examining the connection between grades and EOG scores is to consider the grades received by students by EOG level. In other words, for students at each EOG level, what was their grade within the classroom? Table 4 depicts the grades received for students at each EOG level for reading and mathematics in 2006-07.

- Approximately half (ranging by grade and subject from 48% to 59%) of students with a Level IV EOG score in reading and mathematics received an A in the classroom.
- At Level III, the most common grade received was a B; however, grades among this group were more widely distributed.
- For students who received a Level II, on their reading or mathematics EOG, the modal grade received was a C, with a D being the second most common grade received.
- Among students who scored a Level I, the results varied by grade and subject. The modal grade received in reading and mathematics by grade 7 students was a D, while for grade 6 students the modal grade received was an F in reading and a C in mathematics.

Table 4
Percentage of Students Enrolled in 2007-08 by
2006-07 EOG Level and Grade

| Reading | | | | | | | | |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Grade | Level I | | Level II | | Level III | | Level IV | |
| | Grade 6 | Grade 7 | Grade 6 | Grade 7 | Grade 6 | Grade 7 | Grade 6 | Grade 7 |
| A | 6.4% | 4.4% | 3.8% | 3.4% | 18.4% | 11.3% | 58.4% | 48.1% |
| B | 11.4% | 14.3% | 17.5% | 17.7% | 37.2% | 32.6% | 30.7% | 33.4% |
| C | 21.4% | 24.2% | 33.5% | 28.0% | 25.6% | 30.8% | 8.23% | 12.5% |
| D | 28.6% | 35.2% | 27.0% | 32.3% | 14.3% | 17.4% | 2.4% | 4.8% |
| F | 32.1% | 22.0% | 18.3% | 18.6% | 4.5% | 7.9% | 0.3% | 1.3% |

| Mathematics | | | | | | | | |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Grade | Level I | | Level II | | Level III | | Level IV | |
| | Grade 6 | Grade 7 | Grade 6 | Grade 7 | Grade 6 | Grade 7 | Grade 6 | Grade 7 |
| A | 5.0% | 3.3% | 4.4% | 4.4% | 21.5% | 16.5% | 58.8% | 52.1% |
| B | 16.6% | 16.0% | 23.2% | 22.6% | 42.4% | 41.3% | 33.1% | 38.4% |
| C | 31.3% | 28.8% | 33.5% | 35.2% | 25.8% | 28.5% | 6.9% | 7.9% |
| D | 27.8% | 30.5% | 27.4% | 26.0% | 8.6% | 11.3% | 1.1% | 1.5% |
| F | 19.4% | 21.5% | 11.5% | 11.8% | 1.7% | 2.5% | <0.1% | 0.2% |

Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Note 1: **Blue** font indicates the most common grade within each performance level and grade level.

2: Grade level refers to grade level in 2006-07 for students enrolled in 2007-08.

Interpretation Example: Among students in grade 6 who received a Level IV on their mathematics EOG, 58.8% received an A in the classroom.

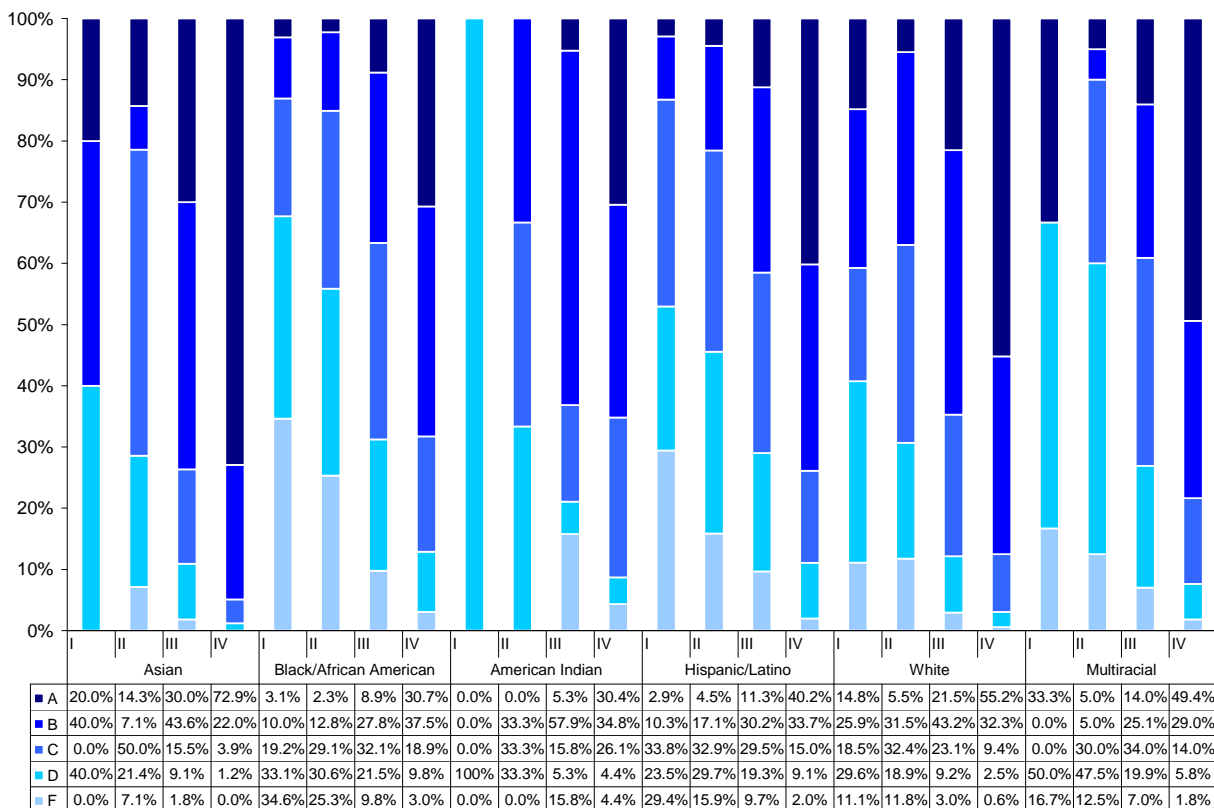
Ethnic Group and Risk Factors

The examination of student grades and EOG level revealed that the pattern varied by ethnicity and risk factors. Figures 8 and 9 display the distribution of grades by EOG level and students' ethnicity. The percentage of students with a Level IV who were able to earn an A within the classroom varied by ethnicity, from 73% of Asian students to only 30% of American Indian students and 31% of Black/African American students. A similar, although less disparate, pattern was found among Level IV students in mathematics, with 74% of Asian students and 45% of Black/African American students earning an A.

As shown in Figure 8, the distribution of reading grades for students at each EOG level varied by ethnicity.

- The percentage of students with a Level IV who earned an A ranged by ethnicity from 73% of Asian students to 30% of American Indian students.
- At Level III, the most common grade received was a B for Asian, American Indian, Hispanic/Latino and White students; however, for Black/African American and Multiracial students, the modal grade was a C.
- Of students with a Level II, the modal grade received was a C for Asian, Hispanic/Latino, and White students, but a D for Black/African American and Multiracial students (American Indians had <5 students in this group).
- Among students who scored a Level I the modal grade received was a D for White and Multiracial students; for Black/African American students the modal score was an F and a C for Hispanic/Latino students.

Figure 8
Percentage of Students Enrolled in 2007-08
by Ethnicity, Reading Grade, and Reading EOG Level in 2006-07



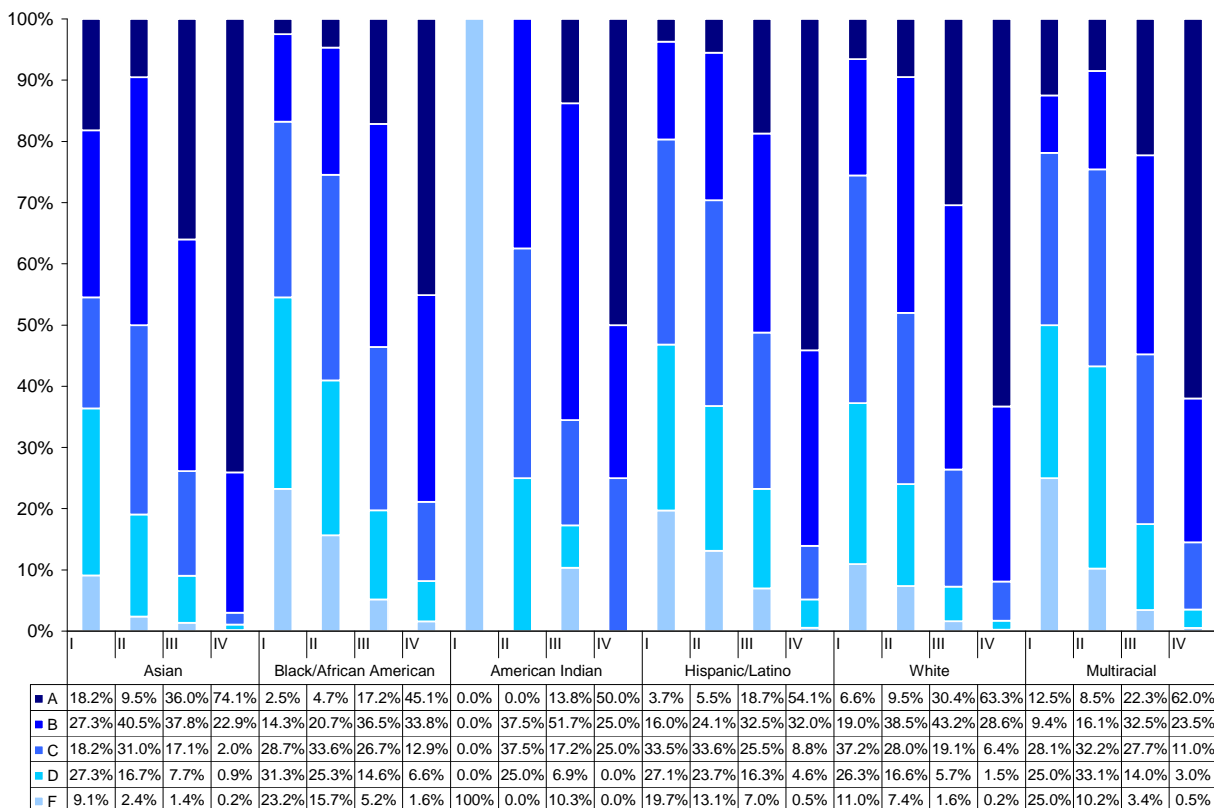
Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Interpretation Example: Among Hispanic/Latino students with a Level IV, 40.2% received an A, 33.7% received a B, and 15% received a C.

As shown in Figure 9, the distribution of mathematics grades for students at each EOG level varied by ethnicity.

- The percentage of students with a Level IV who earned an A ranged by ethnicity from 74% of Asian students to 45% of Black/African American students.
- At Level III, the most common grade received was a B among all ethnic groups.
- Of students with a Level II, the modal grade received was a B for Asian and White students, but a C for Black/African American and Hispanic/Latino students, and a D for Multiracial students (American Indian students were bi-modal with both B and C occurring with equal frequency).
- Among students who scored a Level I, the modal grade received was a C for Hispanic/Latino, White, and Multiracial students, while for Black/African American students, the modal score was an D, and C was the modal score for Hispanic/Latino students (Asian students were bi-modal, with both B and D occurring with equal frequency, and American Indians had <5 students in this group).

Figure 9
Percentage of Students Enrolled in 2007-08
by Ethnicity, Mathematics Grade, and Mathematics EOG Level in 2006-07



Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Interpretation Example: Among Black/African American students with a Level IV 45.1% received an A, 33.8% received a B, and 12.9% received a C.

Algebra I EOC Level

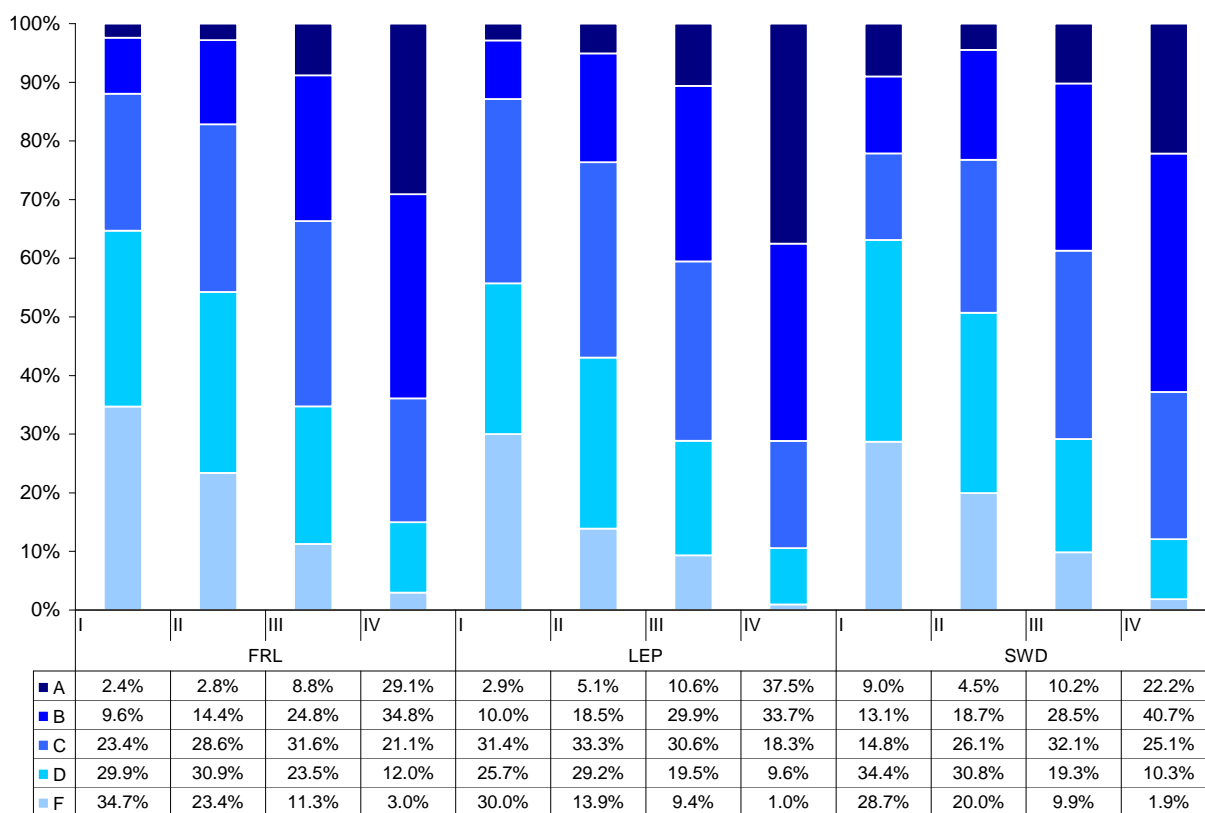
Where students’ scale scores lie within each level score range could help explain some variation in grades given. While this analysis was not done for EOG, Appendix C related to Algebra I and the EOC helps to examine this issue. The table illustrates that differences by ethnicity remained even within the finer gradations of high and low Level IV and high and low Level III scores. For example:

- For students in the high level IV range on the Algebra EOC, 90% of Asian students, 81% of Multiracial students, 71% and 72% of White and Hispanic/Latino students, and 57% of Black/African American students received an A.
- At the low level III level, students across all ethnic groups were more likely to get a C than a B except for Multiracial students (n=6). Black/African American students’ grades were more evenly distributed between a B and C than were the other ethnic groups’ grades.

Figure 10 displays the distribution of reading grades for students at each EOG level by risk factor.

- Among students with a Level IV, 29.1% of FRL students, 37.5% of LEP students, and 22% of SWD students earned an A.
- At Level III, the most common grade received among risk groups (FRL, LEP, or SWD) was a C.
- For students with a Level II, the modal grade received was a D for FRL and SWD students and a C for LEP students.
- Among students who scored a Level I, approximately one-third of students received an F; 34.7% of FRL, 30% of LEP, and 28.7% of SWD students received an F in the classroom.

Figure 10
Percentage of Students with Risk Factors Enrolled in 2007-08
by Reading Grade and Reading EOG Level in 2006-07



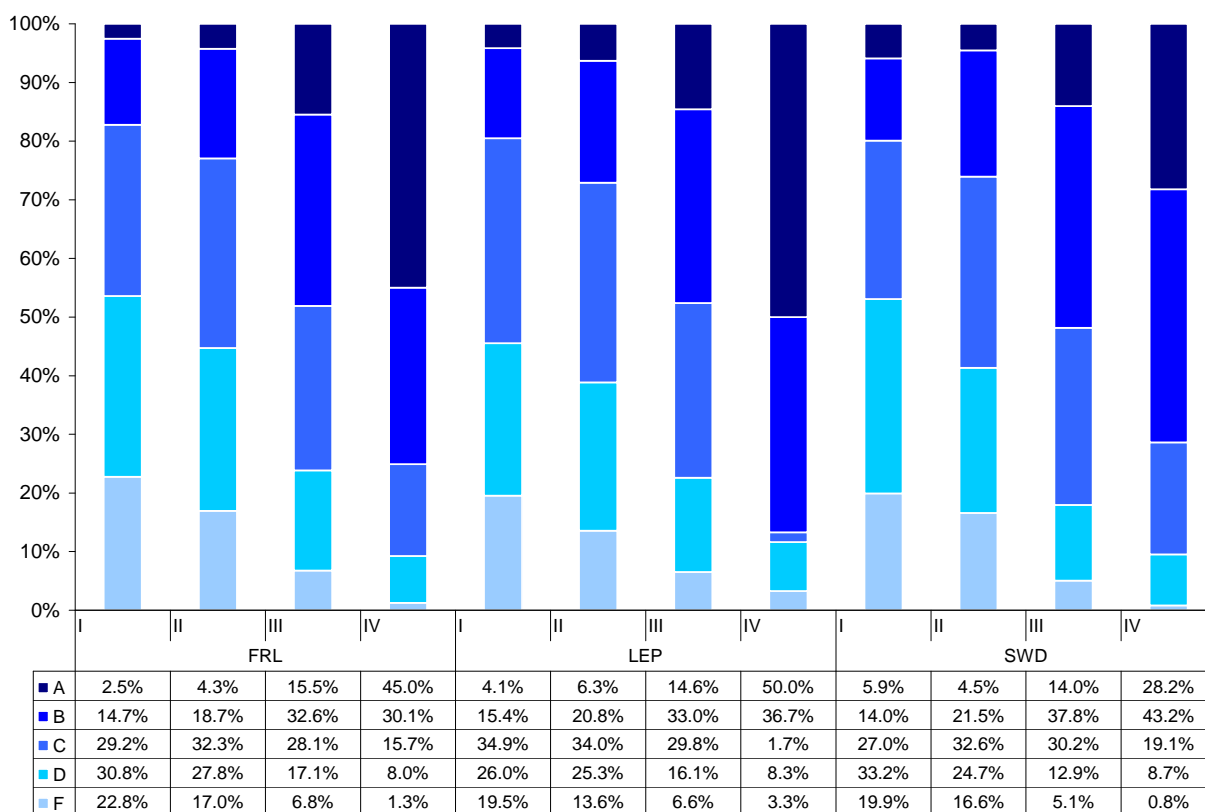
Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Interpretation Example: 29.1% of FRL students with a Level IV received an A in the classroom.

Figure 11 displays the distribution of mathematics grades for students at each EOG level by risk factor.

- Among students with a Level IV, 45% of FRL students, 50% of LEP students, and 28.2% of SWD students earned an A.
- At Level III, the most common grade received was a B among risk groups.
- At Level II, the most common grade received was a C among risk groups.
- At Level I, the most common grade received was a D among FRL and SWD students, and C among LEP students.

Figure 11
Percentage of Students with Risk Factors Enrolled in 2007-08
by Mathematics Grade and Mathematics EOG Level in 2006-07



Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Interpretation Example: Among LEP students with a Level IV, 50.0% received an A and 36.7% received a B.

Question 4: How do classroom grade and EOG score correlations at the middle school level compare to those at the elementary school level?

Elementary School Grades

At the elementary school level, students' classroom grades reflect a 1-4 performance level rather than the traditional A-F grading scale. "The student performance levels of 1 to 4 indicate whether students have met the expectations set by the state in the Standard Course of Study and indicate whether the student has the necessary skills and concepts to be successful in the next quarter or next grade" (K-5 Standards-Based Grading and Reporting: Fact Sheet, 2003, p.1). The requirements for each level are as follows:

- level 4 students extend targeted grade level standards;
- level 3* students demonstrate proficiency of targeted grade level standards with evidence of application over time;
- level 3 students demonstrate proficiency of targeted grade level standard;
- level 2 students are inconsistent and needs support to meet targeted grade level standards; and
- level 1 students have insufficient performance of targeted grade level standards with support (WCPSS Standards-Based Report Card FAQs, 2006).

Teachers examine student performance on each observation of the objective to determine a student's level of mastery of each objective. A student's mastery is determined by observing each objective in the standard course of study three times. The explicit intent of standards-based grading was to standardize grading across classrooms and schools. Work habits are captured under a separate 1-3 rating (Understanding the Elementary School Report Card, p. 1). For additional information on elementary school grading, see the full report on *Standards-Based Grading 2005-06 and 2006-07* (E&R Report No. 08.12) at http://www.wcpss.net/evaluation-research/reports/2008/0812standards_based_grading.pdf.

Comparison of Elementary and Middle School Correlations

Table 5 shows the correlations between students' grades and EOG scores in elementary school (grades 3-5) and middle school (grades 6 and 7). The correlations between middle school students' grades and EOG scores were similar to the correlations between elementary school students' grades and EOGs in that students' mathematics grades had a higher correlation to their mathematics EOG than their reading grade did to the reading EOG. However, the correlations at the middle school level were lower for both reading and mathematics than those found at the elementary school level.

A Spearman's rho was computed to evaluate the relationship between EOG level and grade. A Pearson correlation was conducted to evaluate the relationship between EOG scale score and grade. Both correlations revealed a positive relationship exists between EOG score and grade. While the pattern remained constant for both correlations, the correlation between scale score and grade (the finer measure) was stronger for all grade levels in mathematics and reading (see Table 5 for results of the correlation analysis).

If grades and EOG scores represent two methods of measuring a student knowledge of N.C. Standard Course of Study, then the weaker correlations found in middle school suggest that grades based on an A-F scale have a weaker relationship to students' knowledge of the Standard Course of Study than grades at the elementary level. The inclusion of additional factors such as homework and work habits at the middle school level may account for the weaker correlations between grades and EOG scores because student grades reflects more than knowledge of the material.

Table 5
Correlation of Grade and EOG
by Grade Level in 2006-07

| | Grade Level | EOG Level (Spearman's rho) | Number of students w/ EOG Level | EOG Scale Score (Pearson) | Number of students w/ EOG Scale Score |
|---|--------------------|--------------------------------------|--|-------------------------------------|--|
| Elementary Reading Grade (1-4) | 3 | .67 | n=9,542 | .72 | n=9,344 |
| | 4 | .63 | n=9,335 | .69 | n=9,113 |
| | 5 | .61 | n=8,831 | .66 | n=8,638 |
| Middle Reading Grade (A-F) | 6 | .54 | n=8209 | .58 | n=8,150 |
| | 7 | .49 | n=8260 | .54 | n=8,204 |
| Elementary Mathematics Grade (1-4) | 3 | .74 | n=9,543 | .76 | n=9,359 |
| | 4 | .72 | n=9,337 | .75 | n=9,118 |
| | 5 | .72 | n=8,827 | .76 | n=8,641 |
| Middle Mathematics Grade (A-F) | 6 | .58 | n=8651 | .61 | n=8,651 |
| | 7 | .57 | n=8421 | .60 | n=8,421 |

Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 middle school grade data and Standards-Based Grading 2005-06 and 2006-07 report (E&R Report No. 08.12) which reflected Elementary School grade file and 2006-07 End-of-Year Student Roster.

Interpretation Example: Among students in grade 5 mathematics, grade had a higher correlation to their mathematics EOG (0.72 EOG level / .76 EOG scale score) than for grade 6 students (0.58 EOG level / .61 EOG scale score).

DISCUSSION AND RECOMMENDATIONS

At the middle school level, the vast majority of students received an A, B, or C for both reading and mathematics. However, this distribution varied by ethnicity and risk factor. For both reading and mathematics, Asian and White students were more than twice as likely as Black/African American, Hispanic/Latino, and American Indian students to have an A in the classroom. The opposite is true at the other end of the grade continuum. In fact, very few Asian and White students received a failing grade (<2%), while for Black/African American and Hispanic/Latino students approximately 10% received an F in the classroom. Among students with an academic risk factor (FRL, SWD, and LEP) fewer than 15% received an A in the classroom while the percentage with an F ranged from 10% to 12%.

EOG results also reveal differences by ethnicity, indicating that differences in grades may go beyond demonstrated knowledge of curricular material. Examination of students' grades by EOG level revealed a similar disparity across ethnicity and risk factor. Students who scored a Level IV on the EOG were not equally likely to receive an A in the classroom across all groups. In reading, nearly three-fourths of Asian students and more than half of White students with a Level IV received an A; approximately one-third or fewer of Black/African American and American Indian students with a Level IV received an A. For mathematics a similar pattern was found, although all groups had a higher percentage of students with a Level IV EOG score who received an A (which may reflect the more rigorous EOG standard). This disparity did not disappear when grade patterns were examined for students earning a higher or lower Level IV score on Algebra I. This could be due to a variety of reasons, including homework completion, class participation, computer availability, parent support, and other factors, but this issue definitely deserves further discussion.

Grade distributions varied by school, with the greatest variation occurring among the students who received an A (30 percentage points or more). Similar school-level variations were found at the elementary school level, with the greatest variation in the percentage of students with a Level 4 (the highest grade) across schools.

Furthermore, examination of the variation in grades among schools in the percentage of students receiving an A or B in the classroom and the percentage of students with Level III or IV EOG score revealed considerable variation by school. While grades were not formally designed to match the EOG, both measure students' knowledge of subject material. Thus, a fairly high correlation between grades and EOG scores should be present across schools. While by school differences in student achievement are normal, we would expect the difference between the percentage of students earning A's or B's and the percentage with a Level III or IV to be similar across schools. Thus, large variations in the percentage point difference between the percentage of students with an A or B and the percentage with a Level III or IV should generate questions regarding the consistency of grading across schools. If schools with similar EOG score patterns have wide variation in grading practices, this suggests the standards are being applied differently across schools. These grading differences by school deserve further discussion and study.

Finally, the correlations between middle school students' grades and EOG scores, while moderate positive, were weaker than the correlations found at the elementary school level. The comparison of correlations between EOG scores and grades at the middle school level versus those at the elementary level clearly indicates a stronger relationship between standards-based grades and EOG scores (used as a measure of the N.C. Standard Course of Study) than was

found between middle school grades and EOG scores. Comparing elementary and middle school correlations provided insight into possible drawbacks of the traditional A-F grading system utilized within WCPSS' middle schools and should stimulate further discussions of appropriate grading practices.

QUESTIONS TO CONSIDER

The results of this study and the prior study of elementary school grading can be used as a starting place to drive conversations regarding grading practices. The results of this study and the prior findings of the *Standards-Based Grading 2005-06 and 2006-07 report* (http://www.wcpss.net/evaluation-research/reports/report_topics/other_policy_eval.html). generate questions for further discussion regarding grading practices. The following guiding questions regarding grading can be used to facilitate discussions within Professional Learning Communities/Learning Teams and between school staff and parents.

For Teachers and Administrators

1. Should grades reflect students' knowledge of the NC Standard Course of Study? If so, what method of grading best reflects this knowledge? Many options exist which could lead to much different grades for students. Three options described by Marzano (2008), include:
 - a. examining trend lines across the grading period based on a pre-assessment of all material to be covered;
 - b. starting at a basic level and only addressing one level at a time; or
 - c. utilizing a pre-assessment of all material and then individualizing instruction.
2. What factors are included in determining students' grades? Should work habits and homework be included? What role should practices such as extra credit and re-tests play?
3. Why are there differences by ethnicity and risk factors in the distribution of grades--even within the same EOG level?
4. Are grading standards being applied consistently across classroom and schools? How much flexibility should be given to teachers within and across schools?
5. What data could be reviewed during the year to check consistency across teachers of the same subject?

For Parents

1. What factors are included in determining my student's grades? Does my student's grade reflect subject knowledge, effort, or both?
2. If my child does not demonstrate mastery initially of required skills, what opportunity do they have to demonstrate mastery later and how will this factor into their grade?
3. Does my student's final grade reflect the student's knowledge of the course content? How should they relate to EOG scores?

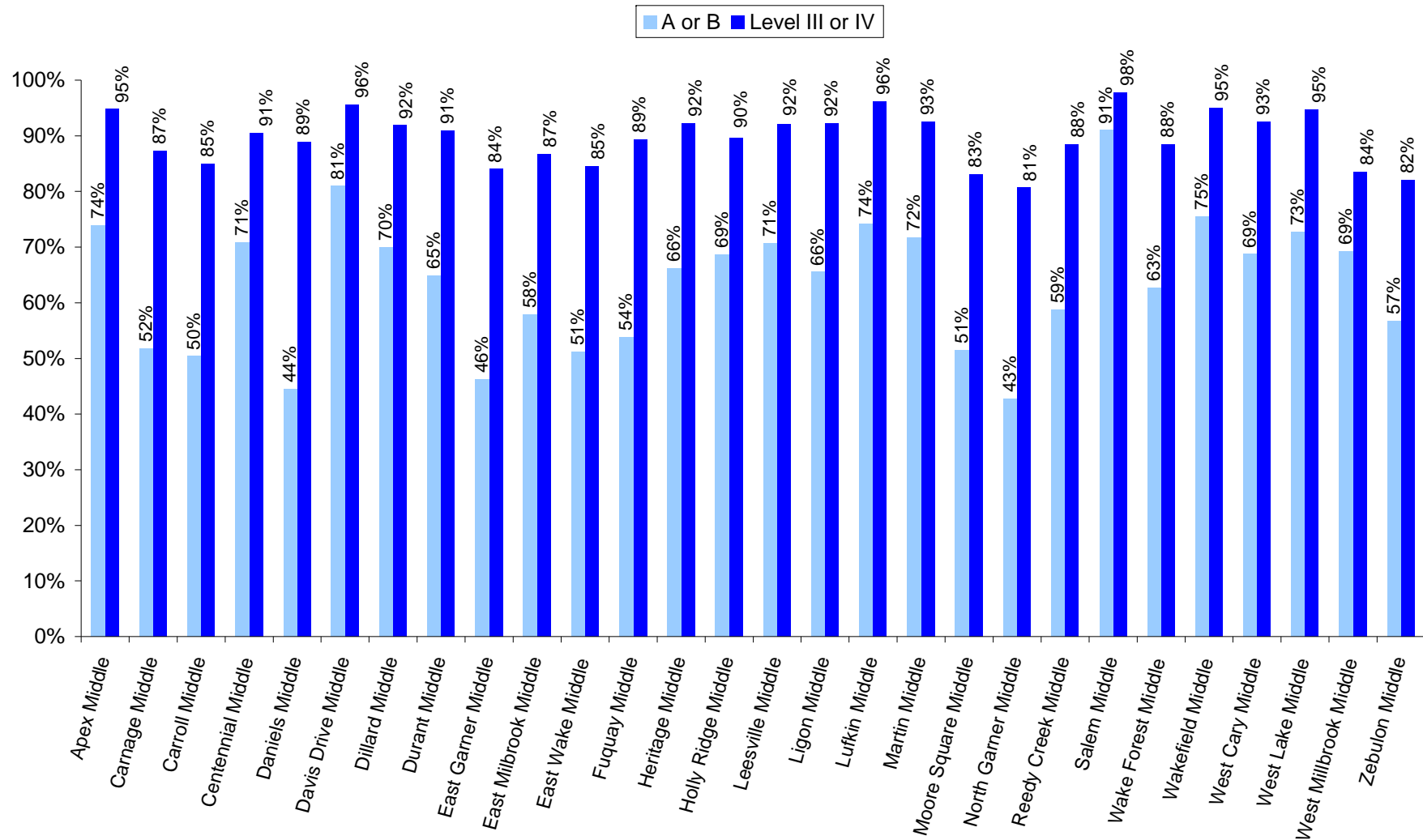
Addressing these questions and other questions on grading practices will help move us toward understanding and implementing a more reliable and valid grading system within all WCPSS schools. Reducing differences by ethnic group and risk factor especially for those with similar achievement test scores should be the goal.

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APPENDIX A

Percentage of Students Enrolled in 2007-08 Receiving an A or B in Reading in 2006-07 and Percentage of Students with Level III or IV on 2006-07 Reading EOG



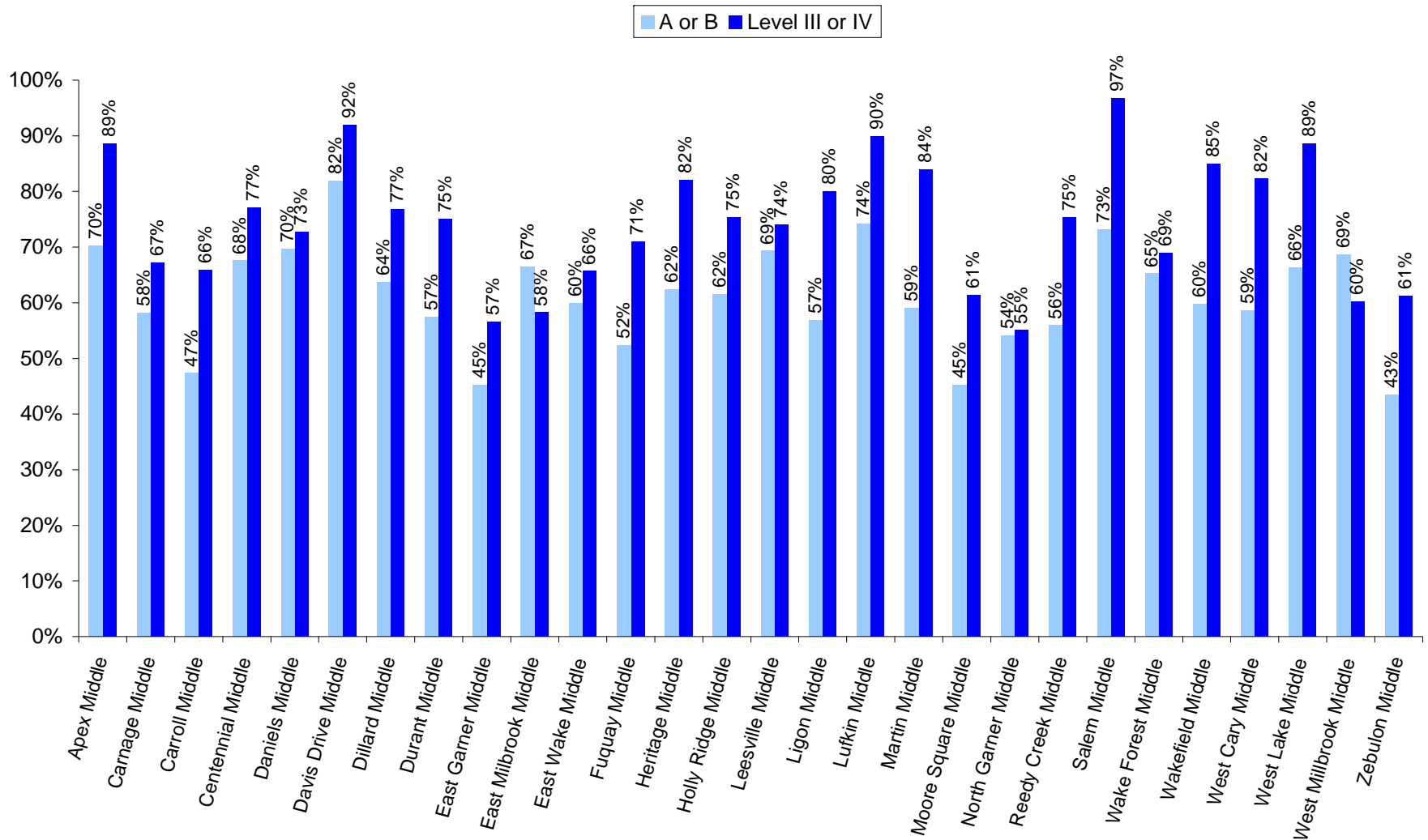
Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Interpretation Example: While 84% of students received a Level III or IV on the EOG at both West Millbrook Middle and East Garner Middle, 69% of students received an A or B at West Millbrook while only 46% received an A or B at East Garner.

Note: East Cary and Wendell Middle Schools are not included on this table since in 2007-08 only grade 6 students were enrolled and these students did not have middle school grades in 2006-07.

APPENDIX B

Percentage of Students Enrolled in 2007-08 Receiving an A or B in Mathematics in 2006-07 and Percentage of Students with Level III or IV on 2006-07 Mathematics EOG



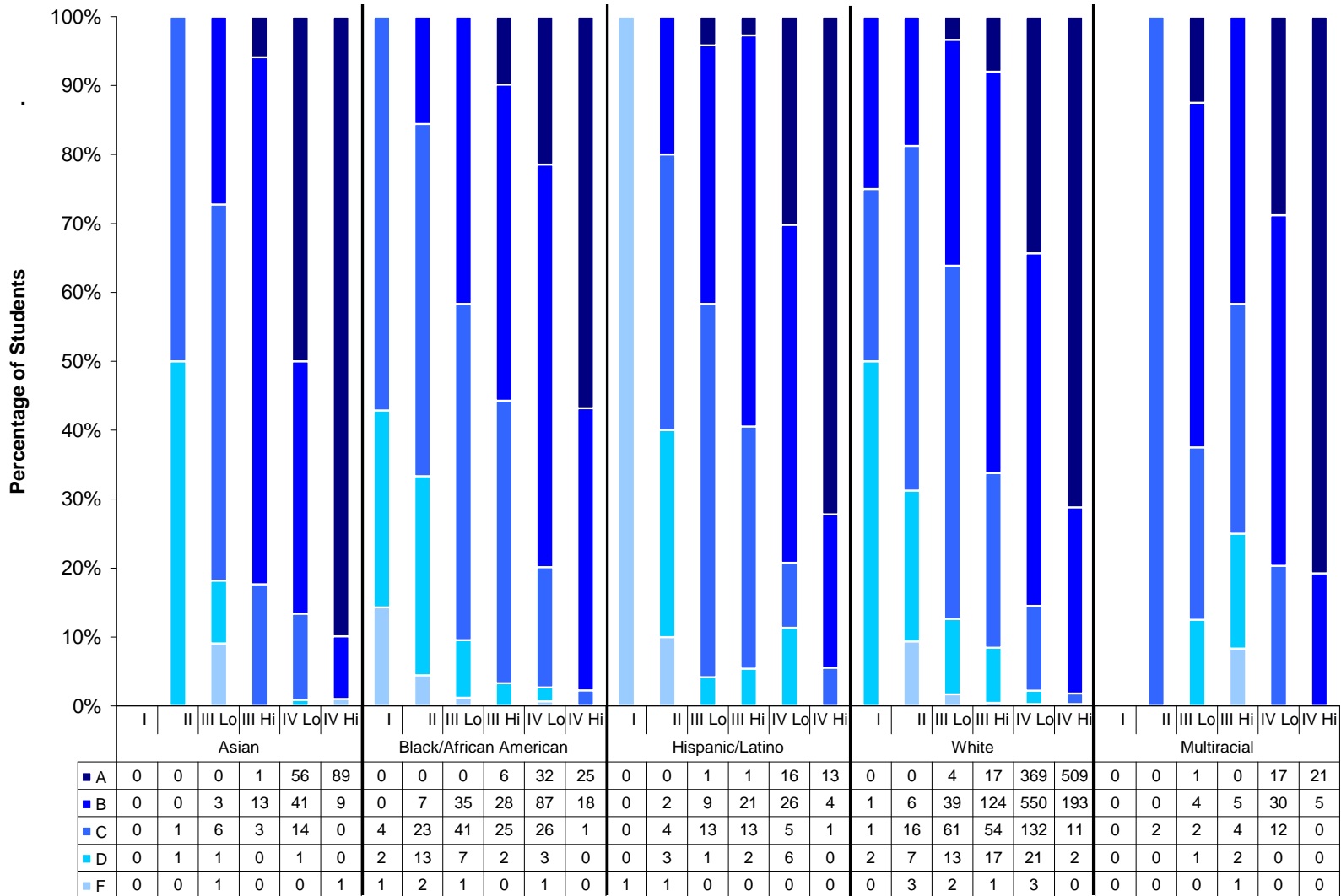
Data Source: NCWise 2007-08 End-of-Year Data file for 2006-07 grade data and 2006-07 End-of-Year Student Roster.

Interpretation Example: At West Millbrook Middle 60% of students received a Level III or IV on the EOG and 69% received and A or B while at Zebulon Middle 61% of students received a Level III or IV on the EOG and only 43% received and A or B in the classroom.

Note: East Cary and Wendell Middle Schools are not included on this table since in 2007-08 only grade 6 students were enrolled and these students did not have middle school grades in 2006-07.

APPENDIX C

Number and Percentage of Students Enrolled in Algebra I in 2007-08 by Ethnicity, Algebra I Grade, and Algebra I EOC Level



Data Source: NCWise 2007-08 (SIGR1110)

Interpretation Example: 90% (89 of 99 students) Asian students with a high Level IV Algebra I EOC score had an A in the classroom while only 57% (25 of 44 students) of Black/African American students with a high Level IV had an A.

Note: American Indians were not included in this figure due to the small sample size (N=5).