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## High School End-of-Course Exams Show Proficiency Gains for 2010

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## HIGH SCHOOL END-OF-COURSE EXAMS SHOW PROFICIENCY GAINS FOR 2010

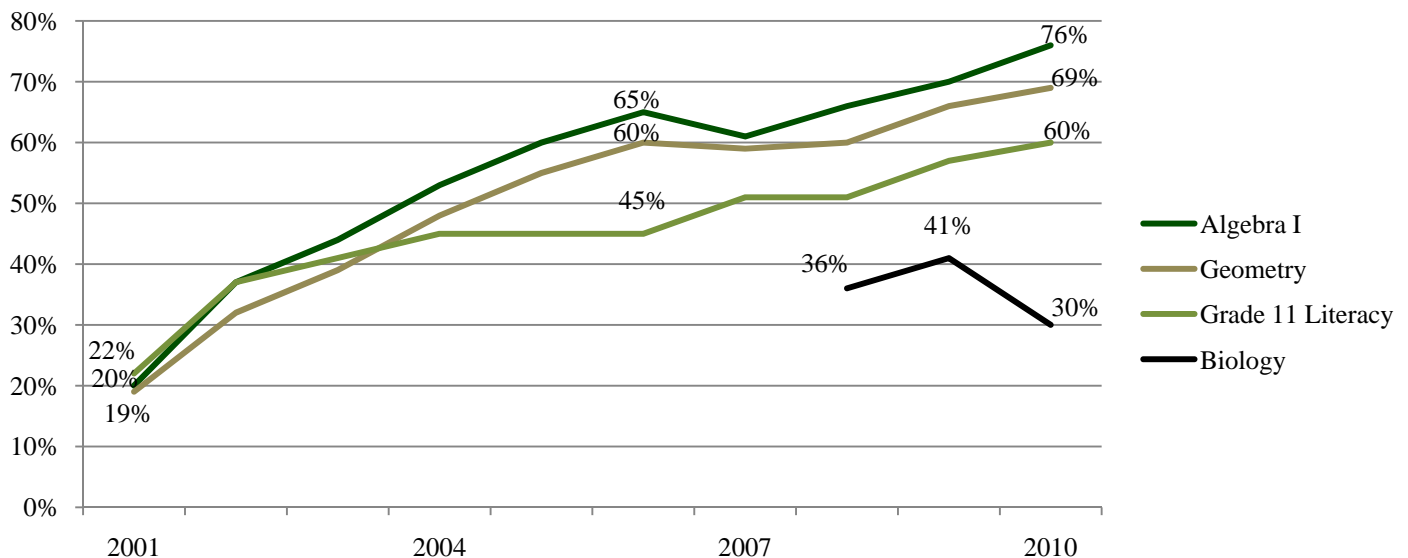
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In July, the ADE released results for the 2009-10 end-of-course (EOC) exams given in Algebra I, Geometry, and Biology administered in April 2010. These results followed the Grade 11 Literacy results released in June. First, we present statewide 2010 results compared to last year. Second, test scores are examined across the state by districts' region, poverty level, and size. Third, we consider the performance of Arkansas students on other assessments to see if these results are consistent with EOC results.

The development of today's statewide accountability testing, aligned with curricular frameworks, was first mandated by Arkansas Act 999 of 1999. With the

passage of the law, both benchmark and end-of-course (EOC) exams were developed. EOC exams have since been administered in four subjects: Algebra I, Geometry, Biology, and Grade 11 Literacy. End-of-course exams are designed to measure learning at the high school level aligned with curriculum frameworks developed and mandated by the state. The exams are thus considered a kind of measuring stick for learning in subjects most students must take and pass before graduation. As final statewide tests in four subjects, end-of-course exams must be given by schools to every student except those who are disabled or have limited English proficiency (LEP).

*Figure 1. End-of-Course (EOC) Exams, Statewide Percent Scoring Proficient or Advanced, 2001-2010*



Arkansas students taking end-of-course exams in April showed relatively high proficiency rates (see Figure 1), measured as the percentage of students scoring proficient or advanced on an end-of-course exam. In Algebra I and Geometry, statewide proficiency rates were 76% and 69%, respectively. The proficiency rate in grade 11 literacy was 60%, while it was significantly lower in Biology, at 36%.

Arkansas' end-of-course proficiency rates improved over 2009 test administrations in three of four tested subjects. Students taking the 2010 exam in Algebra I achieved proficiency at a rate 6 percentage points higher than last year's 70%, while Geometry proficiency improved by three percentage points from 66% a year ago. Grade 11 Literacy showed an improvement of 3 percentage points

as well, from 57% in 2009. The state proficiency rate declined only in Biology, from 2009's 41% to this year's 36%.

These gains continue trends over the last few years (see Figure 1). Statewide proficiency rates have steadily increased since the tests were initially implemented. When end-of-course exams were first administered in 2001, proficiency rates were near 20% in tested subjects.<sup>1</sup> The past ten years have seen a steady upward

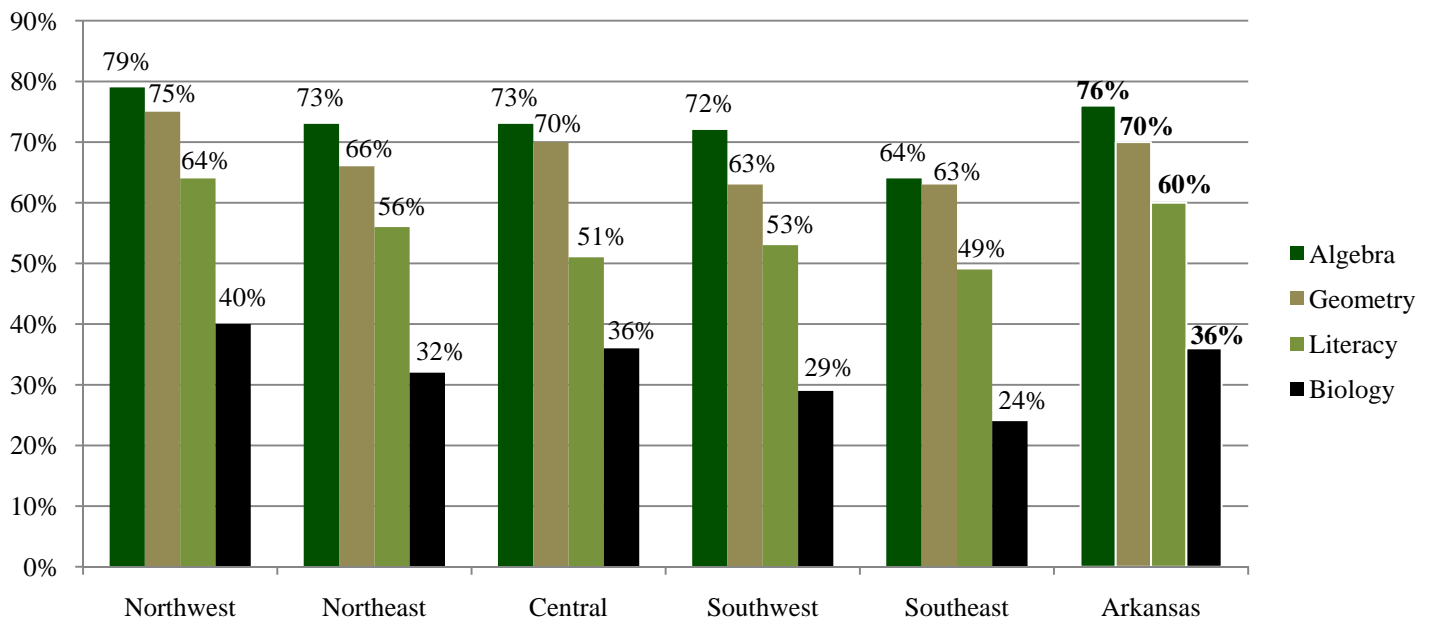
<sup>1</sup> Tested subjects in 2001 were Algebra I, Geometry, and Grade 11 Literacy. The EOC Biology exam was first administered in 2008.

trend in all subjects, and the gains observed for 2010 are comparable to gains in recent years. In the three subjects for which tests were well-established (Algebra I, Geometry, and Grade 11 Literacy), the average 2010 gain was four percentage points. By comparison, the average gain for those three subjects from 2008 to 2009 was 5.7 percentage points (Biology is excluded from gain comparisons for 2009 and 2010 because changes in proficiency rates are volatile in the two years immediately following an exam's development and initial administration).

### High School Performance Around the State

Scores recently released by the ADE in July were provided at the school level, allowing for analysis of EOC proficiency rates for different groups of schools across the state. Proficiency patterns are examined here in three categories: region, poverty level, and district enrollment.

Figure 2. End-of-Course Proficiency Summarized by Geographical Region, 2010



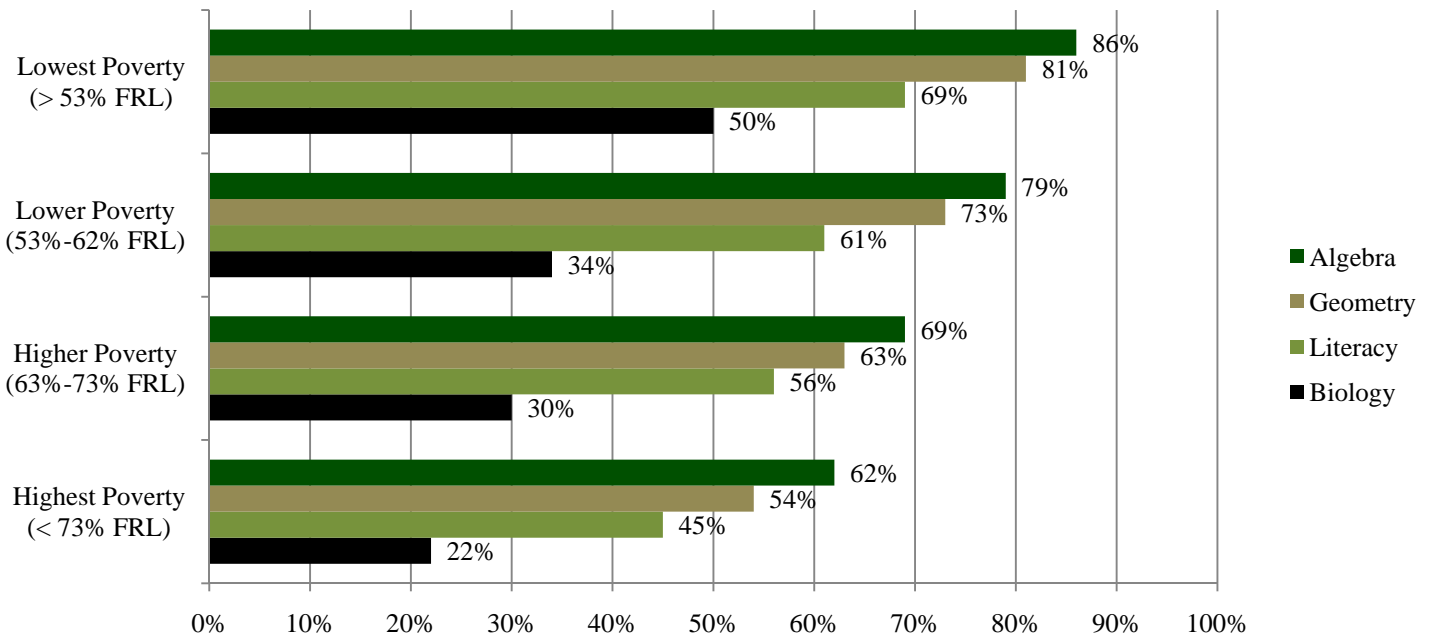
The relationship between poverty levels and student achievement continues to be a matter of concern to educators and policymakers. End-of-course proficiency can be examined with respect to districts' poverty levels by averaging students' proficiency rates depending on districts' levels of free- and reduced-lunch (FRL) usage (see Figure 3). Statewide, about 60% of students participated in the federal free- and reduced-lunch program in 2009-10. This can be broken down by district FRL percentages into four groups ranging from high to low poverty. Such an analysis shows that districts with lower poverty levels have consistently higher student

Schools across Arkansas can be classified geographically in five regions, divided as the central region and four surrounding quadrants. End-of-course proficiencies for these five regions are summarized in Figure 2 below. Among the five regions, the state's Northwest showed the highest proficiency rates on all four EOC exams in 2010, with its difference from the state average ranging from an advantage of 6 percentage points in Geometry to 3 percentage points in Algebra I. The Central and Northeast regions averaged near or just below state averages on each of the four tests. The southern regions of Arkansas tested furthest below the state average. Proficiency rates in the Southwest were between 4 and 7 points below the state average, while Southeast proficiency rates ranged from 6 to 12 percentage points below Arkansas averages.

achievement.<sup>2</sup> In all four subjects, proficiency rates increase from lower-income quartiles to higher. Large differences exist between the highest and lowest quartiles. The state's lowest-poverty districts outperformed the highest-poverty districts by 26 percentage points in Algebra I, 27 in Geometry, 28 in Biology, and 24 percentage points in Grade 11 Literacy.

<sup>2</sup> All Arkansas districts are broken down into quartiles according to the percentage of a district's students receiving free or reduced lunch. Proficiency percentages are district percentages weighted by population, thereby giving student averages, not district averages.

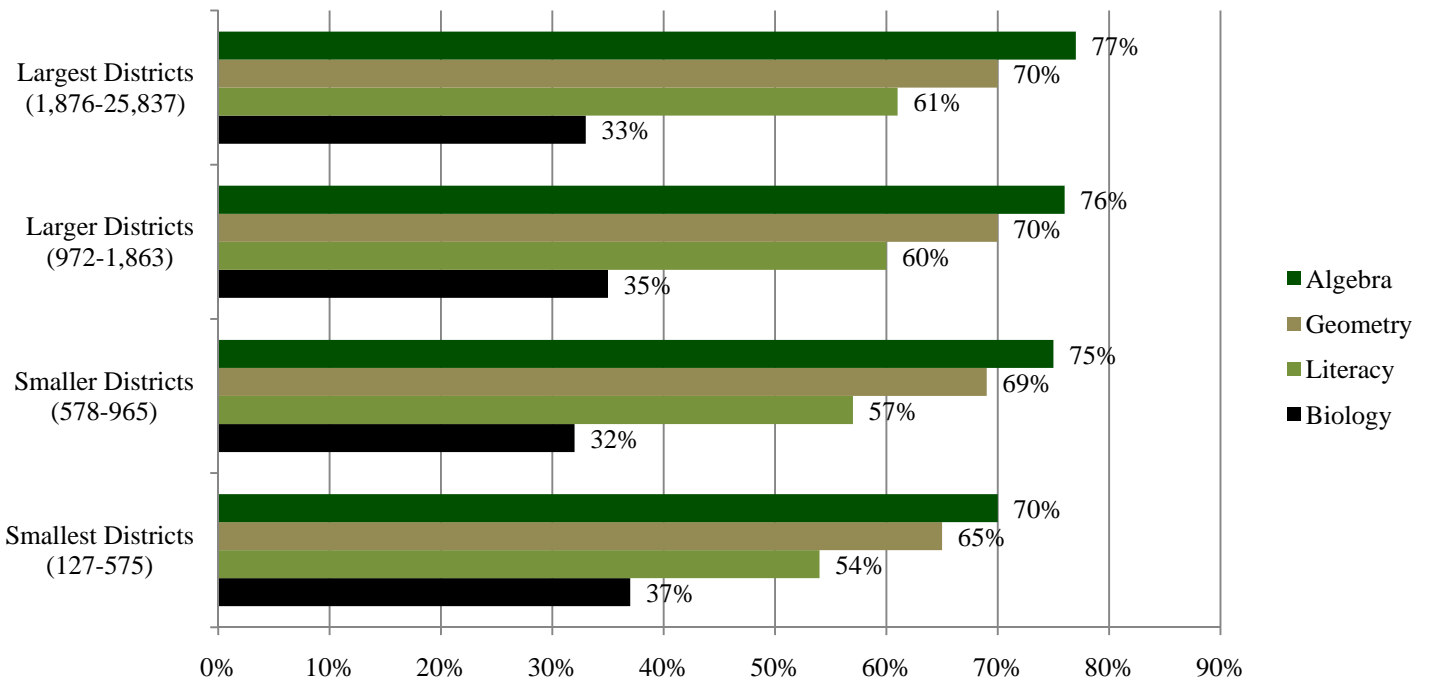
Figure 3. End-of-Course Proficiency Summarized by District Poverty Level, 2010



Lastly, end-of-course data show a small relationship between proficiency rates and district size, as measured by total district enrollment. Larger districts tend to have slightly higher proficiency rates than smaller districts. Differences based on district size are much smaller than those observed with respect to poverty levels. For example, the state's 64 largest districts showed proficiency rates between four and seven percentage points higher than the 64 smallest districts, whereas differences between the top and bottom quartiles on

poverty levels were between 24 and 28 percentage points. Examining trends across tested subjects, the quartile of smallest districts appears to achieve proficiency at a substantially lower rate than larger districts in Algebra I and Geometry. This trend is less clear in Biology and Grade 11 Literacy. Most likely, much of this variation can be explained by other factors such as geography and poverty levels: smaller districts tend to be located in areas of the state with low population density and/or high levels of poverty.

Figure 4. End-of-Course Proficiency Summarized by District Size, 2010

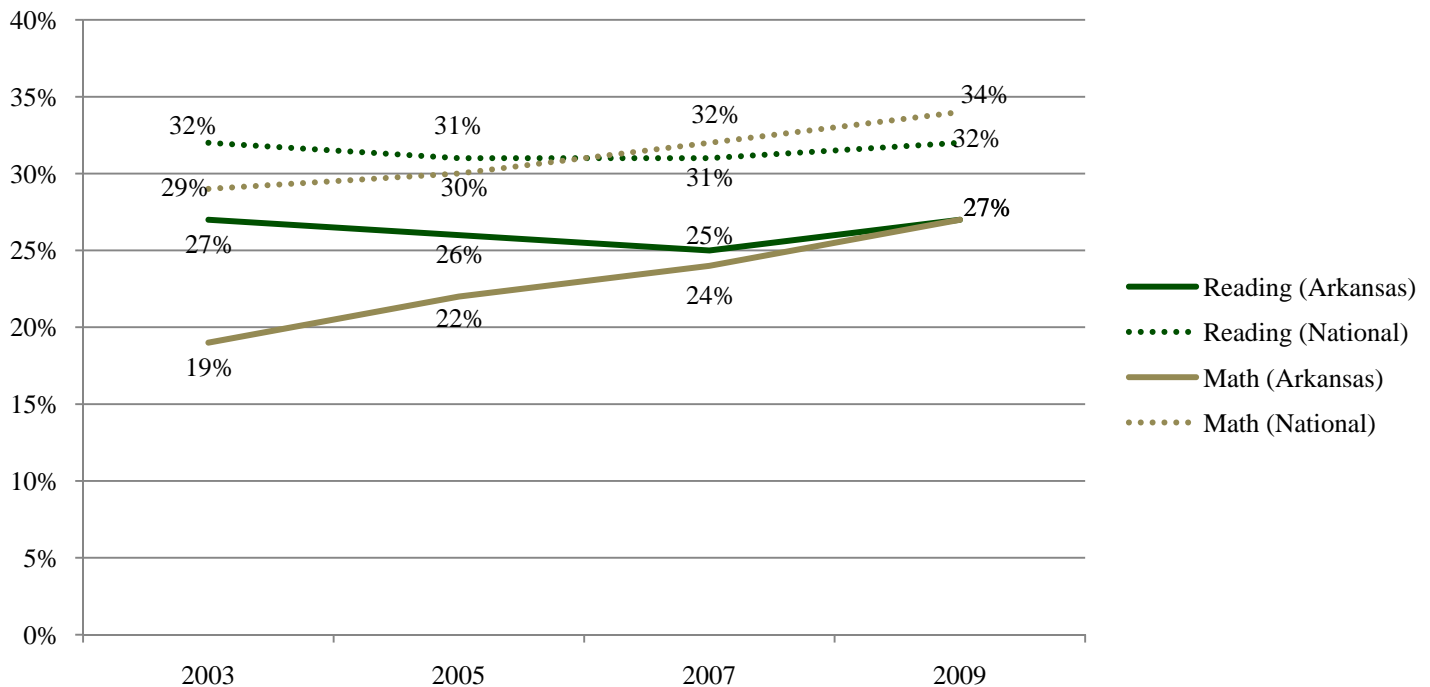


## Benchmarking the Benchmarks

Educators and policymakers have been interested for several years in determining whether proficiency increases such as those observed here in Arkansas are attributable to progress in student learning, test inflation, or some combination of the two. That is, it seems a common phenomenon from state to state for proficiency rates to rise with each passing year as students are exposed to a test. Nonetheless, the question should continue to be pursued so that meaningful conclusions about student learning can be drawn from test scores. For the purpose of understanding the extent to which proficiency gains on Arkansas' EOC exams are "real" (that is, not only the result of increased comfort with a test), two data sources are most suitable: the National Assessment of Educational Progress (NAEP), and the American College Test (ACT).<sup>3</sup> NAEP scores from grade 8 provide a snapshot of student learning prior to when most students take EOC exams, and ACT scores in general provide a post-EOC snapshot.<sup>4</sup>

Given as proficiency percentages in Figure 5, NAEP trends for Arkansas over the last six years have been positive in math and flat in reading. These results mirror trends for the nation as a whole. Arkansas students taking the NAEP in 2009 achieved proficiency at a rate of 27 percent in math, where in 2003 only 19 percent of Arkansas grade 8 test-takers were proficient. This 8 percentage point gain compares favorably with the nation as a whole, against which Arkansas closed its achievement gap from 10 percentage points (19% to 29%) in 2003 to 7 percentage points (27% to 34%) in 2009. In reading, both Arkansas and the nation have shown a flat trend since 2003. As measured by the NAEP, Arkansas reading proficiency in 2009 was 27%, the same percentage as in 2003. In both years, reading proficiency for the nation as a whole was five points higher at 32%. If the NAEP is used as a point of comparison, it appears that Arkansas students' achievement in math has improved, while reading achievement has shown little change.

Figure 5. NAEP Proficiency Grade 8, 2003-2009

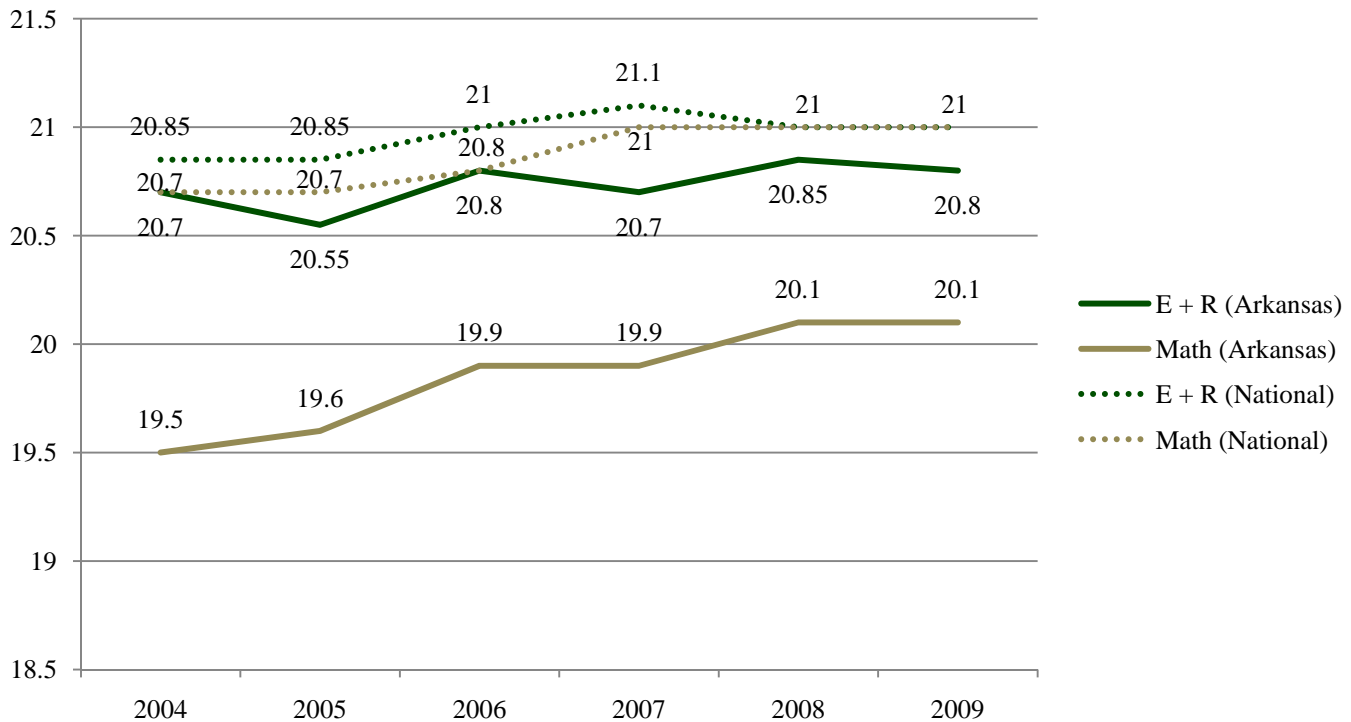


<sup>3</sup> In comparing achievement on different tests, valid inferences can be drawn if the populations taking the two tests are closely similar, and the content tested on each test is also similar. If either of these diverge too much, comparisons between the two tests become less tenable.

<sup>4</sup> NAEP scores from grade 12 are available from the last decade for the year 2005 only. This prevents the observation of trends in student learning over time for grade 12.

Arkansas' ACT test scores over the past several years show a similar trend to that observed on the NAEP. Shown in Figure 6, statewide ACT math scores increased from 2004 to 2009 while English and reading scores showed little change.<sup>5</sup> Despite the increase in math scores, Arkansas students still lag the national average by a greater margin in math than reading. National trends in both subjects were flat. The similarity of gains on the ACT with NAEP trends suggests broad progress in Arkansas' math achievement.

Figure 6. ACT Averages in English + Reading and Math, 2004-2009



Taken together, NAEP and ACT scores suggest that end-of-course proficiency gains seen in Algebra I and Geometry are indicative of real progress in student learning, and are not only the result of test inflation. These points of comparison tell less in favor of real progress in Literacy, since both tests showed little or no change in Arkansas' reading achievement at the secondary level. While these comparisons are imperfect, they nonetheless shed light on how much Arkansas' EOC exams are reflecting progress in student achievement.

### SUMMARY

As measured by the most recent EOC exams, Arkansas high school students are making progress in math and literacy. Students' proficiency on the Biology EOC, while showing a decline from the previous year, is still unclear as the test is relatively new. Within these gains, large gaps still persist between poor and wealthy districts, as well as between the state's regions. Readers should be cautioned against inferring that these school characteristics are the cause of proficiency differences. The observed gains are at least partly indicative of real progress in student learning, as secondary students across the state have shown steady progress in math on both the NAEP and the ACT. The most recent EOC test scores suggest that proficiency in literacy is lower than in math, and that in comparison to other tests, EOC gains in literacy may or may not be attributable to real gains in student learning. Taken together, these results suggest the state should place a renewed emphasis on increasing high school literacy, with the hope that such efforts might produce results comparable to that seen over recent years in math.

*For more information about this policy brief, please contact the Office for Education Policy at [oepp@uark.edu](mailto:oepp@uark.edu)*

<sup>5</sup> Arkansas' ACT results for spring 2010 are not given since the testing regime differed substantially from prior years. Many Arkansas districts chose for the first time in 2010 to administer the ACT to all students, meaning that some students who took the test otherwise would not have. Predictably, this lowered state averages. For this reason, 2010 Arkansas averages are not strictly comparable to previous Arkansas averages.