

Summary Points

- 4th grade Math scores were statistically significantly lower than 2013 scores.
- 4th grade Reading scores declined slightly, but were not significantly different from 2013 scores.
- 8th grade Math and Reading declined slightly but were not significantly different from 2013 scores.
- Nationally, 4th grade Math scores declined as well.
- Arkansas' border states increased performance in 4th grade math.
- Common Core States experienced a slight decline in 4th grade Math scores.
- States that did not adopt the CCSS did not decline in 4th grade Math scores.
- The reason for Arkansas' significant decline in 4th grade Math remains unclear.

National Assessment of Educational Progress (NAEP) Results: 2015

The National Center for Education Statistics has released this year's NAEP results which measure nationwide student performance in 4th and 8th grade Reading and Math. NAEP is administered nationally to a representative sample of students from all 50 states, so acts as a standard measure of student performance across states and time. This policy brief will examine Arkansas' 2015 results and consider possible causes and implications.

NAEP Results: Statewide

The 2015 NAEP results present a somewhat grim picture as Arkansas' student performance declined in all areas. As can be seen in Figure 1, math scores are typically higher than reading scores and 8th graders score higher than 4th graders. Although all scores declined since 2013, only the 4th grade Math results are statistically significantly different

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from the 2013 results. In 2013, the average math scale score for Arkansas 4th graders was 240, which dropped to 235 in 2015. There was a three point drop from 2013 in 8th grade average scale scores for both reading and math. The smallest decline was in 4th grade Reading, moving from an average scale score of 219 in 2013 to 218 in 2015.

Over the past 12 years there has been essentially no change in reading scale scores at 4th and 8th grades. Although math scores have increased, over time, it is unclear if 2015 will be the beginning of a continuous decline or just a temporary setback in Arkansas student success.

Figure 1: Average Scale Score on Arkansas' NAEP Exams, 2003-2015

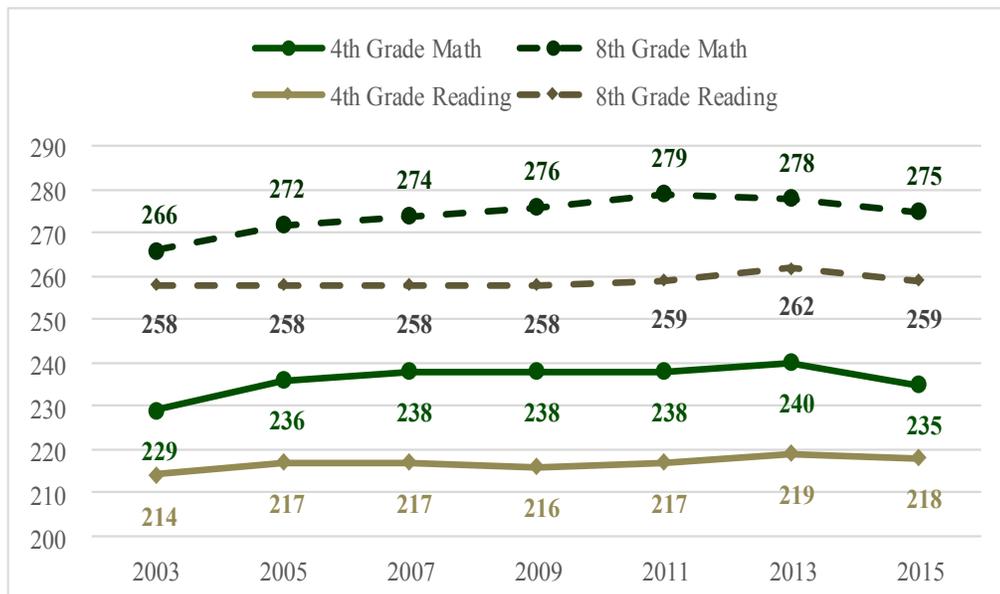


Table 1: Student Demographics for Arkansas, Border States and US, 2015

	% White	% Black	% Hispanic	% FRL
AR	64%	21%	10%	61%
Border States	53%	26%	9%	59%
US	51%	16%	24%	50%

Border States: Louisiana, Missouri, Mississippi, Oklahoma, Tennessee, Texas

Figure 2: NAEP Mean Scale Score for 4th Grade Mathematics: Arkansas, Border States and US, 2003-2015

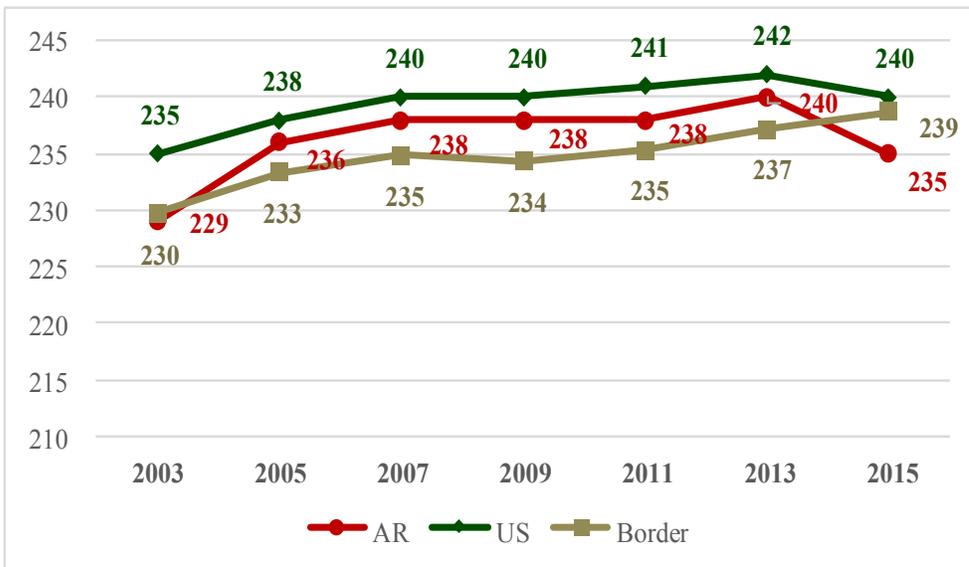
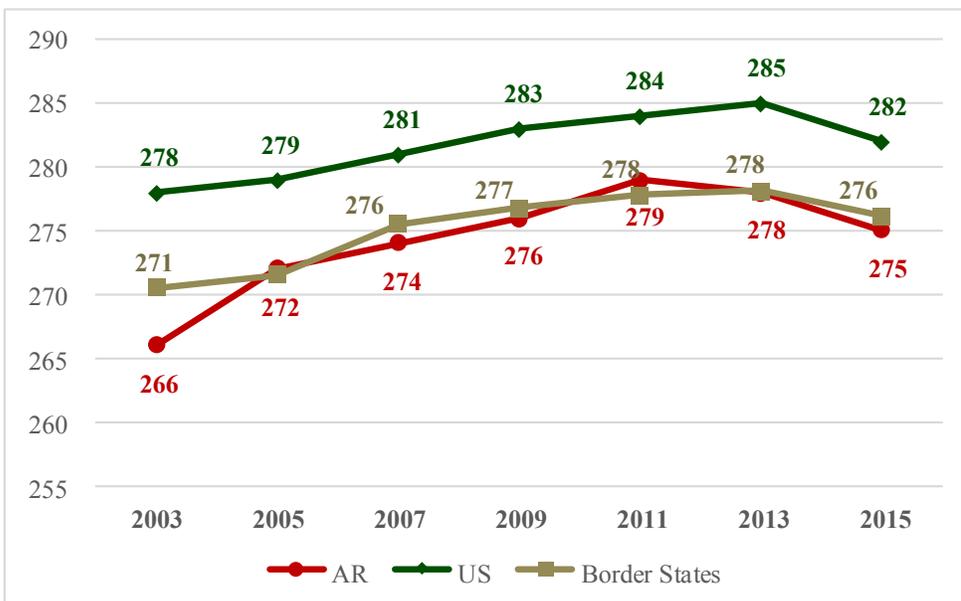


Figure 3: NAEP Mean Scale Score for 8th Grade Mathematics: Arkansas, Border States and US, 2003-2015



How Do We Compare?

Arkansas students score below the national average in Reading and Math at both 4th and 8th grades. As shown in Table 1, however, Arkansas has a higher percentage of students eligible for Free or Reduced Lunch (FRL) than the country as a whole. Since FRL is a proxy measure for poverty, and poverty is related to performance on standardized assessments, it is not surprising that Arkansas' performance would be lower than the national average. The percent of students eligible for FRL in the states that border Arkansas (59%) is, however, very similar to Arkansas' 61% eligibility. We would not anticipate significant differences between the performance of students in Arkansas and the students in the bordering states. Figures 2-5 reveal, however, that in 2015, Arkansas students were outperformed by students in border states.

In 4th grade Math, Arkansas was the lowest performing state in comparison to its border states and the US in 2003. Scores increased, however, and in 2005-2013, Arkansas surpassed the border states in average scaled score (see Figure 2). In 2015, however, Arkansas' score decreased five points. Border states increased by two points this year, surpassing Arkansas' performance. The US decreased by two points in relation to 2013, but still maintained an average scale score that was higher than that of Arkansas and its border states.

Grade 8 Math students present a different story (see Figure 3). Once again, Arkansas had the lowest average scale score in 2003 compared to its border states and the US. Over time however, Arkansas and its border states continued to have average scale scores that were similar to each other between 2005 and 2015. Unlike 4th grade math, Arkansas, the border states and the US all experienced a decline in 2015 scores.

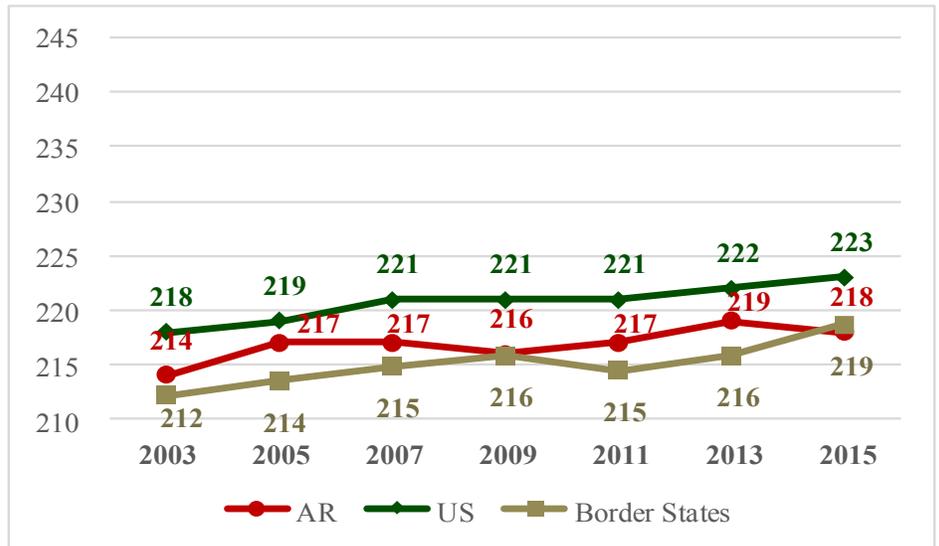
Trends presented by NAEP Reading assessments at the 4th and 8th grade level differ quite a bit from each other.

In 4th grade Reading, Arkansas' average scale score was generally higher than that of its border states in 2003 through to 2013 (see Figure 4). In 2015, however, Arkansas' average scale score declined by one point while its border states experienced a nine point increase. The US has steadily increased in scale score over time and continued to have an average scale score that was higher than that of Arkansas and its border states.

Arkansas' 8th grade Reading students performed similarly to its border states as its average scale score was almost exactly the same as that of the border states in 2003 through 2013 (see Figure 5). Arkansas experienced a three point decline between 2013 and 2015, putting them at a lower performance level than its border states who maintained the same average scale score in that time period. The US as a whole continues to have higher average scale score than Arkansas and its border states, although it also experienced a decline in 2015.

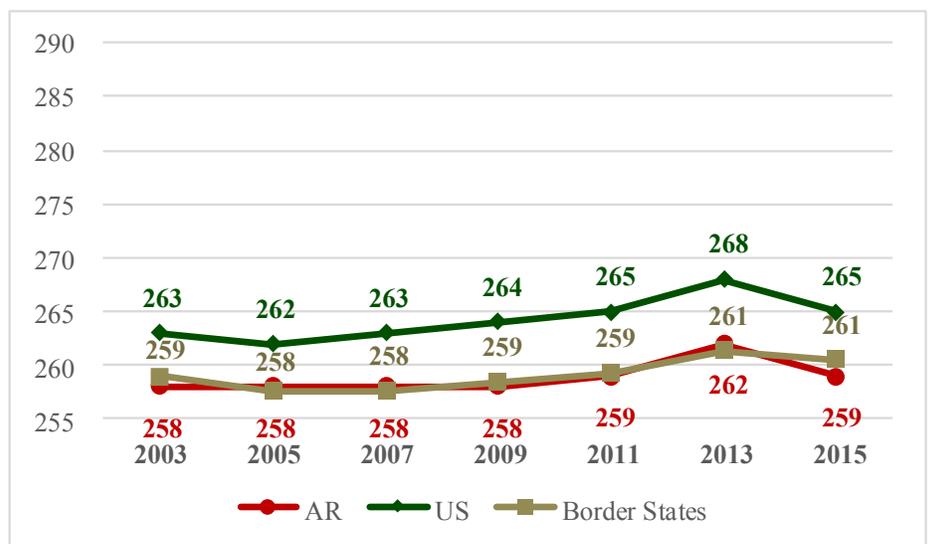
Looking through Arkansas' test results through the lens of poverty and demographics, there are some inconsistencies with the results. Performance in 4th grade Reading, 8th grade Math and 8th grade Reading is similar to the performance of border states with similar demographics. In addition, the state trends generally follow the national trends, although at a lower level. Notably, 4th grade Math scores declined significantly in Arkansas, while rising in the border states. Thus, even after considering poverty and demographics, the question still remains: "What is the cause of Arkansas' decline in 4th grade Math performance in 2015?"

Figure 4: NAEP Mean Scale Score for 4th Grade Reading: Arkansas, Border States and US, 2003-2015



Did You Know?
 Arkansas' 4th grade reading proficiency rate is not significantly different than the US overall!

Figure 5: NAEP Mean Scale Score for 8th Grade Reading: Arkansas, Border States and US, 2003-2015



Is Common Core to Blame?

Arguments surrounding the Common Core State Standards (CCSS) in Arkansas' schools have been very prevalent within the last few years. We wondered if the shift in standards that have taken place since could have contributed to Arkansas' decline in performance on the NAEP.

The Common Core State Standards were adopted by the Arkansas State Board of Education in July 2010. Transition into implementing CCSS began in the 2010-11 academic year. They were first implemented in grades K-2 in 2011-12 and eventually fully implemented in grades Kindergarten through 12 in the 2014-15 academic year.

Pursuing the question of whether or not the full implementation of CCSS in 2014-15 could have impacted Arkansas' performance, we compared Arkansas with other states that have implemented the standards as well as those that have not. We calculated the average scale score of states that have implemented the CCSS, the average scale score of those states that did not implement the Standards and have compared it to that of Arkansas in each of the individual NAEP exams to see if there were any significant trends that appear.

Table 2 list the states that have and have not implemented the CCSS as of 2015.

Table 2: Common Core State Standards by State Adopting Status, 2015

Adopted the Common Core State Standards				Did Not Adopt
Alabama	Idaho	Missouri	Pennsylvania	Alaska
Arizona	Illinois	Montana	Rhode Island	Indiana
Arkansas	Iowa	Nevada	South Dakota	Minnesota*
California	Kansas	New Hampshire	Tennessee	Nebraska
Colorado	Kentucky	New Jersey	Utah	Oklahoma
Connecticut	Louisiana	New Mexico	Vermont	South Carolina
Delaware	Maine	New York	Washington	Texas
District of Columbia	Maryland	North Carolina	West Virginia	Virginia
Florida	Massachusetts	North Dakota	Wisconsin	
Georgia	Michigan	Ohio	Wyoming	
Hawaii	Mississippi	Oregon		

* Only adopted ELA

Figure 6 shows that 4th grade Math students in states that have implemented the Common Core Standards have an average scale score that closely matches that of states that have not implemented the standards. Arkansas' scale score continues to be lower than that of the other states but it can be seen that the gap has steadily decreased up until 2009. After this point, the gap between Arkansas and other states began to widen. In 2015 a more significant gap is seen. Arkansas experienced a five point decline in scale score, states that have implemented the Common Core experienced a two point decline where those that have not implemented the stand-

Figure 6: NAEP Mean Scaled Score for 4th Grade Math: Arkansas, CCSS States and Non-CCSS States, 2003-2015

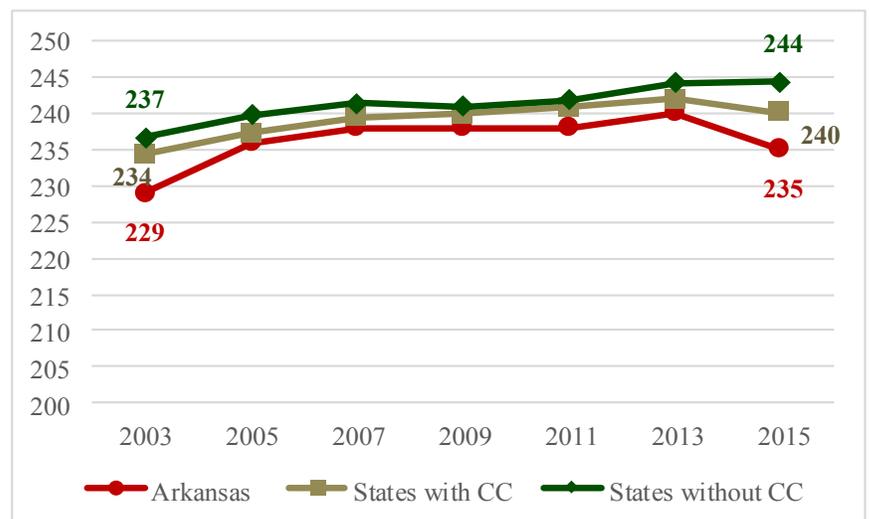


Figure 7: NAEP Mean Scaled Score for 8th Grade Math: Arkansas, CCSS States and Non-CCSS States, 2003-2015

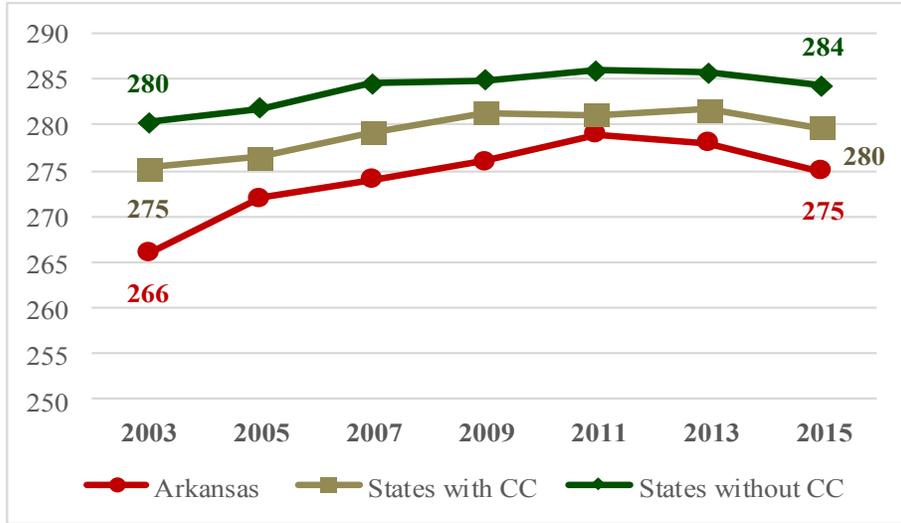


Figure 8: NAEP Mean Scaled Score for 4th Grade Reading: Arkansas, CCSS States and Non-CCSS States, 2003-2015

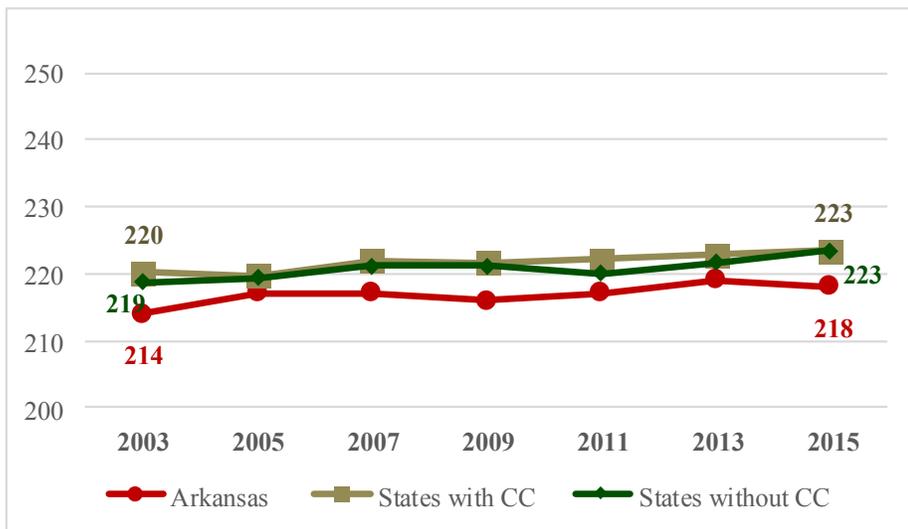
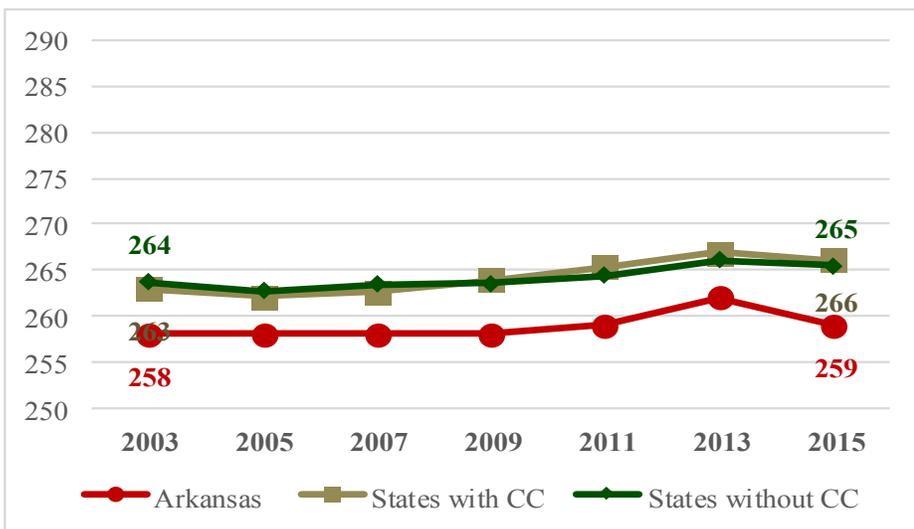


Figure 9: NAEP Mean Scaled Score for 8th Grade Reading: Arkansas, CCSS States and Non-CCSS States, 2003-2015



ards maintained the same score between 2013 and 2015. Is this enough to say that the Common Core Standards are responsible for the decline?

In considering the 8th grade Math scores in Figure 7, a different story emerged. All states have experienced a decline in performance between 2013 and 2015 after steadily increasing in scale score over the years. Arkansas has experienced a three point decline in scale score where other states have shown a two point decline between 2013 and 2015.

4th and 8th grade Reading students do not vary much in the trend they have presented over the years as illustrated in Figures 8 and 9. It can be seen that there are not discrepancies between states that have adopted Common Core Standards and those that have not over the years; their values were almost exactly the same with each other. In both cases, Arkansas steadily improved over time but declined in 2015.

If CCSS implementation led to lower performance on the NAEP, we would expect to see consistent patterns of decline for CCSS states, and no decline for non-CCSS states. There is no evidence for this with the exception of 4th grade Math, where CCSS states decline while non-CCSS states do not. The decline for other CCSS states, however, is not as significant as Arkansas' decline. It is important to note that the NAEP was not developed to measure Common Core Standards, so there may be imperfect alignment between standards and the assessment. Although the fidelity and quality of CCSS implementation varied across states, we must conclude that Common Core State Standards are not the sole contributor to this decline in Arkansas' performance.

So, Why the Decline?

The only significant decline was in Arkansas' 4th grade Math scores. Perhaps the students who took the 4th Grade NAEP in 2015 were academically lower achieving than students who had completed the NAEP in previous years.

To determine whether or not the trend in student performance seen in the 4th grade NAEP exams was consistently seen in the other assessments taken in Arkansas, we examine the 3rd grade Benchmark exams of the prior academic years. Although NAEP is administered to only a representative sample of students in the state, we can assume that the students who completed the NAEP in 4th grade in 2015 were representative of students who completed the Arkansas Benchmark exams in 3rd grade in the prior year, 2013-14. We have illustrated the 3rd grade Benchmark percent proficient for every other academic year as those are the students that would have taken the 4th grade NAEP exams in the following year. It is important to note that performance on the Arkansas Benchmark exams is not directly comparable to performance on the NAEP exams. The proficiency expectation for the NAEP exam is much higher than the performance expectation for proficiency on the Arkansas Benchmark exams. We can examine the trends in performance, however, to see if the relative changes over time are consistent (if proficiency rates increase and decrease on both exams).

In math, Arkansas steadily increased in the percentage of Proficient/ Advanced students between 2005-06 through to 2011-12 just as with the NAEP exams, but shows a 3% decline between 2011-12 and 2013-14. NAEP Math showed a steeper decline of eight percentage points from 2013 to 2015. The trend in the Benchmark patterns of the years are similar to that of the NAEP exams, but does not present us with a cause for Arkansas' significant decline in 4th grade Math performance on the 2015 NAEP.

Figure 10: Arkansas 3rd Grade Benchmark Math Percent Proficient and Subsequent 4th Grade NAEP Math Percent Proficient, 2005-06 through 2013-14

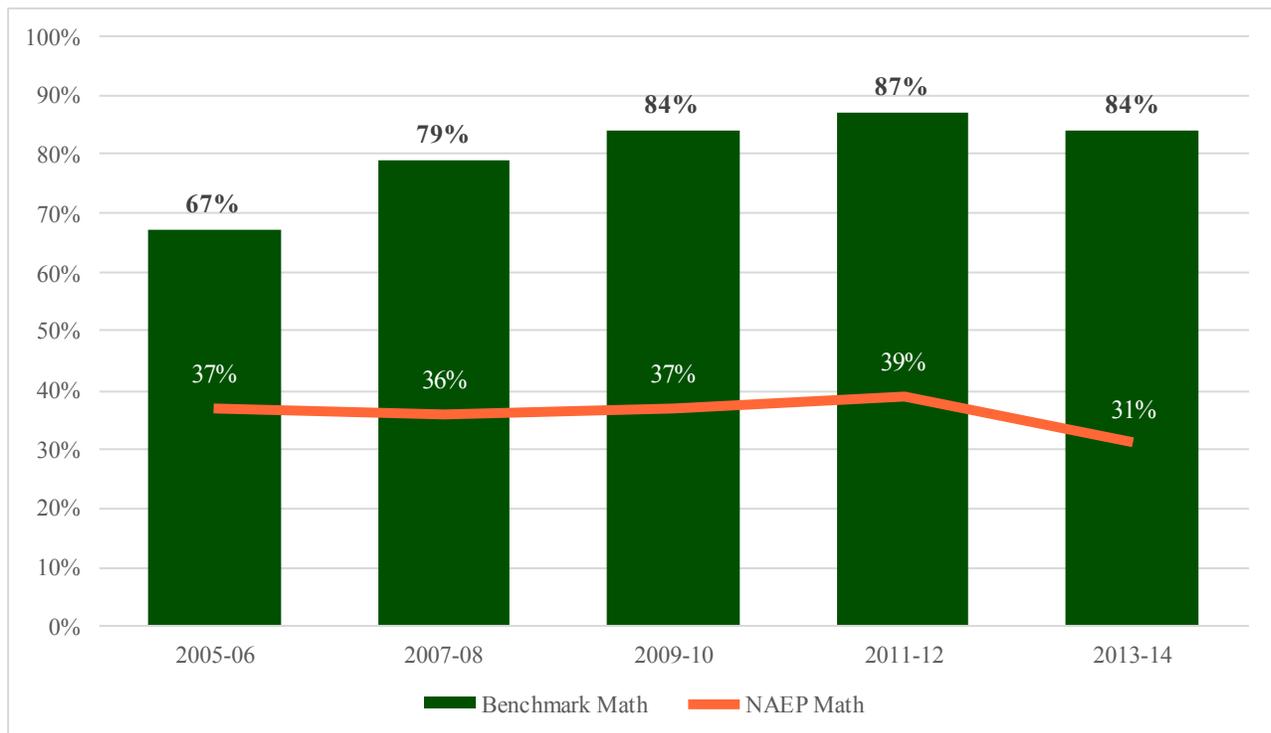


Table 3: PARCC and NAEP Percent Proficient, by Grade and Subject, 2014-15

2014-15 Grade Level	PARCC Math	NAEP Math	PARCC ELA	NAEP Reading
4th	24%	32%	34%	32%
8th	17%	25%	32%	27%

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Change in Assessments

In the 2014-15 academic year, the Arkansas Benchmark exams were replaced by the Partnership for Assessment of Readiness for College and Careers (PARCC) to measure student achievement. The results of the 2014-15 PARCC exams and NAEP proficiency by grade can be seen in Table 3. The numbers presented in the table indicates the percentage of students that achieved at least at the Proficient level in the Math and Reading/ Literacy exams at the 4th and 8th grade levels. It is interesting to notice that PARCC Math scores reflect an even lower percentage of students proficient than the NAEP exams.

In summer 2015, the State Board of Education decided that the PARCC exams will be replaced by ACT Aspire beginning in the 2015-16 school year. This assessment will be administered to students in grade 3-10 in English, Reading, Math, Science and Writing.

Summary

The results are inconclusive at this point as to why Arkansas NAEP performance, specifically 4th grade Math, has declined since 2015. Considering poverty rates and Common Core does not help pinpoint the cause of its academic decline. The shift in assessments that have taken place within the last year, poverty and racial demographics may have been contributors but not the sole reasons for Arkansas’ decrease in academic performance.

ACT Aspire is a new test, so trends in performance will be undetectable for a few years. The next time we will be able to make meaningful comparisons with other states will be the 2017 NAEP. Schools have a critical need for better information from high quality interim assessments so that there can be a clearer sense of what is affecting the student performance, and can fix it before the one-year decline turns into a trend.

Sources:

<http://nces.ed.gov/nationsreportcard/states/> This was used to record the Math and Reading Scale scores for all states as well as the demographic information for each state.

http://www.nationsreportcard.gov/reading_math_2015/#mathematics/state?grade=4

http://www.nationsreportcard.gov/reading_2013/

http://www.nationsreportcard.gov/reading_2011/

http://www.nationsreportcard.gov/reading_2009/

http://nces.ed.gov/programs/coe/indicator_cge.asp This was used to obtain the racial demographics at the national level.

<http://www.corestandards.org/standards-in-your-state/> This was used to determine which states have implemented the Common Core State Standards.

http://www.arkansased.gov/public/userfiles/Learning_Services/Curriculum%20and%20Instruction/CCSS/timeline_040711.pdf

