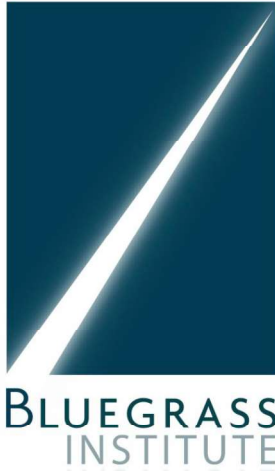




WHILE KENTUCKY'S EDUCATION SYSTEM WAS SLEEPING ...

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by Richard G. Innes • April 2022**



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While Kentucky's education system was sleeping ...

By Richard G. Innes

During the past few years, Kentuckians have heard a lot of claims that the state's public education system used to rank at the bottom of all the states when the Kentucky Education Reform Act of 1990 (KERA) was passed but has improved in recent years and now ranks in the "middle of the pack."

But is this right?

Using powerful tools available in the NAEP Data Explorer web tool¹ to analyze results from the National Assessment of Educational Progress (NAEP), this paper examines how Kentucky really performed both in the early 1990s and in the most recently available results from 2019. This paper follows recommendations from the NAEP itself about how to conduct more meaningful state-to-state comparisons of data. The paper also includes some enlightening comparisons of Kentucky's progress to that in Florida and Mississippi, two states where different sorts of education innovations clearly are working better.

Along the way, be ready for some surprises (Mississippi?? Really??) that lead to a more accurate, though also more sobering, picture of how the Bluegrass State's public education system has really performed over time.

WHY THIS PAPER DOESN'T COMPARE OVERALL AVERAGE NAEP SCORES FOR EACH STATE

This paper – for some very good reasons – limits its analysis to disaggregated performance for Black and white students, the two predominant student racial groups in Kentucky during the years that Main State NAEP data is available.

This approach is consistent with guidance from the NAEP's own literature. Past NAEP Report Cards since at least 2005 discuss that when comparing performance across states or jurisdictions – including comparisons to national average scores – it's necessary to examine more than just overall average scores to develop a full and accurate picture of relative performance.

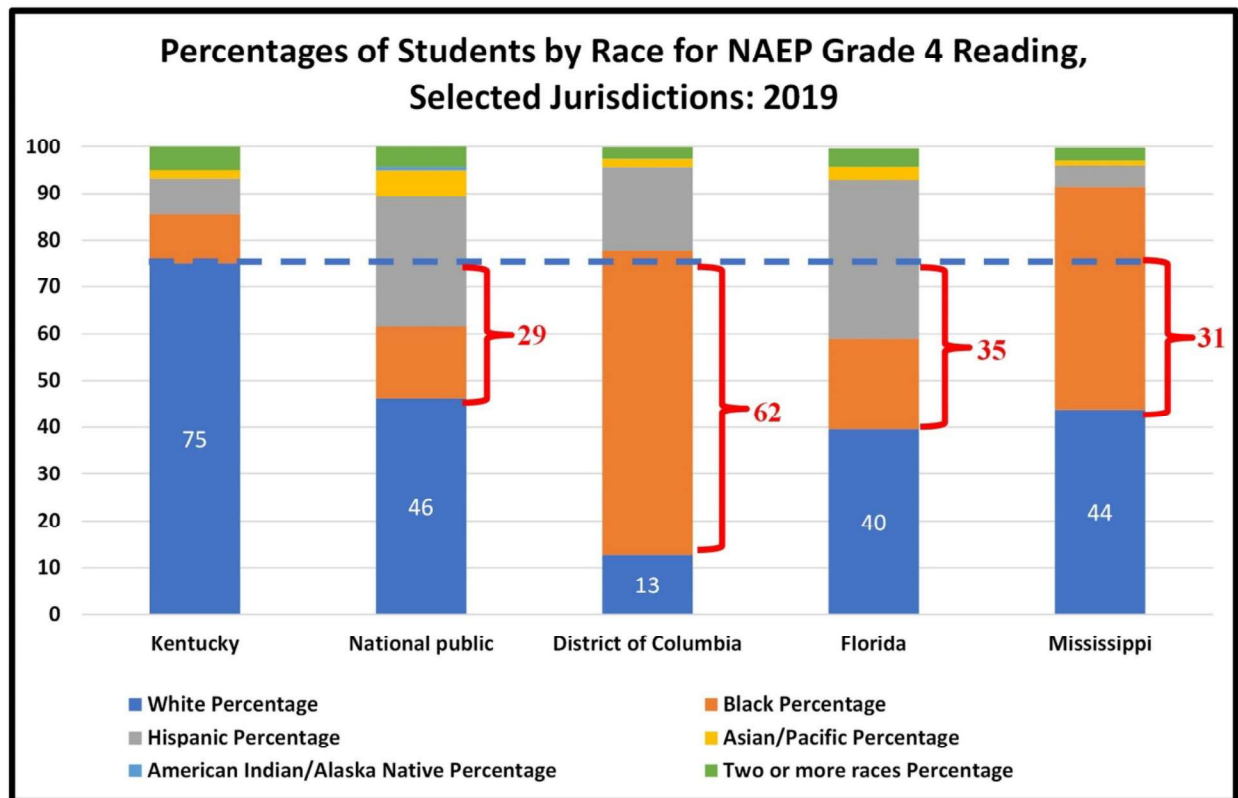
The reason disaggregated analysis is needed is fairly easy to understand; different states now have widely varying student demographics. As a result, only comparing overall average scores for the states generally winds up becoming an "apples to oranges" comparison. Furthermore, very different performances for student subgroups can be hidden by a shallow analysis that only looks at overall average scores.

One of the more detailed discussions of making valid cross-jurisdiction comparisons with the NAEP is found in a discussion in the NAEP 2009 Science Report Card² in which results from Kentucky provide an illustrated example of how the picture from NAEP changes notably once you break the results out by race. The example points out that Kentucky's overall average 2009 Grade 8 NAEP Science score is statistically significantly higher than the national average score. However, when the NAEP results are broken out by race and white student scores are separately considered, Kentucky's whites score statistically significantly below the national average for all white students. Once you consider that whites continue to make up a very large majority of Kentucky's school age population, the seriousness of the misconception created by looking only at overall average scores becomes more apparent.

Too many education analysts in Kentucky regularly fail to dig deep enough to get the clear picture offered by disaggregating NAEP scores. That results in inflated pictures of Kentucky's performance. Let's see why this happens.

Figure 1 shows the racial demographics of public school students in some selected jurisdictions in the 2019 Grade 4 NAEP Reading Assessment. The data were obtained from the NAEP Data Explorer.

Figure 1



In Figure 1, Kentucky’s white students are by far the largest percentage of its total enrollment compared to white student percentages in any other jurisdiction shown, including having a 29-point higher white enrollment than the national public school average and a percentage more than 30 points higher than the white percentages in both Florida and Mississippi, two states we’ll also address in this paper.

Thanks to the racial achievement gaps, which are present everywhere across the nation, comparing whites – even Kentucky’s whites – to students of color elsewhere creates a false picture of performance. Impressions created by such overall score comparisons are obviously going to be misleading.

Obtaining an accurate view of how state public education systems compare with each other, whether we’re using the NAEP or some other measure, requires recognizing the major differences in student demographics across the states and digging deeper than just overall average score comparisons.

Fortunately, the NAEP Data Explorer allows extraction of data broken out by different racial groups. The NAEP Data Explorer also features a “Create Significance Test” tool that provides both a straight ranking based on test scores and, in a more statistically sound manner, shows states that scored statistically significantly higher, the same as, or statistically significantly lower than each listed state.

So, let’s look at how Kentucky shapes up over time using NAEP’s own analysis tools.

WHITE STUDENT STATE RANKINGS OVER TIME

We start by comparing the performance of white public school students on NAEP Grade 4 Reading from the earliest administration in 1992 to the most recent one in 2019. We only consider public school results for states that had white student scores reported in both years.

EXPLAINING THE PRESENTATION OF THE DATA

Examine the left side of Figure 2, which shows the rankings for NAEP Grade 4 Reading in 1992. In this comparison, and in all that follow, Kentucky was designated as the “focus state,” so its data are highlighted in light blue (following depictions show the highlighting in green).

In the column titled “Cross Jurisdiction Significant Difference,” the numbers shown are the score differences for each state relative to Kentucky’s NAEP Scale Score of 214, which is shown in the far-right column in the 1992 section of Figure 2.

For example, white students in the top scorer, the District of Columbia Schools, scored 246 on NAEP Grade 4 Reading, which is 32 points higher than Kentucky’s score. The deep blue shading for the District of Columbia’s difference in score from Kentucky’s and the up-pointing arrow in the right side of the “Cross Jurisdiction Significant Difference” column indicate that this 32-point difference was statistically significantly higher than Kentucky’s score, as well.

What does that 32-point difference mean? A number of researchers who work with the NAEP consider a NAEP Scale Score difference of 10 points to be an indication of about a full extra year of learning.³ Thus, the data suggest that as of the fourth grade, white students in the District of Columbia are more than three years ahead of Kentucky’s whites in reading ability.

While 34 jurisdictions outscored Kentucky in 1992, not all participants did. Those seven states which have their score difference from Kentucky’s shown in medium blue shading tied Kentucky after the sampling errors in the scores are considered.

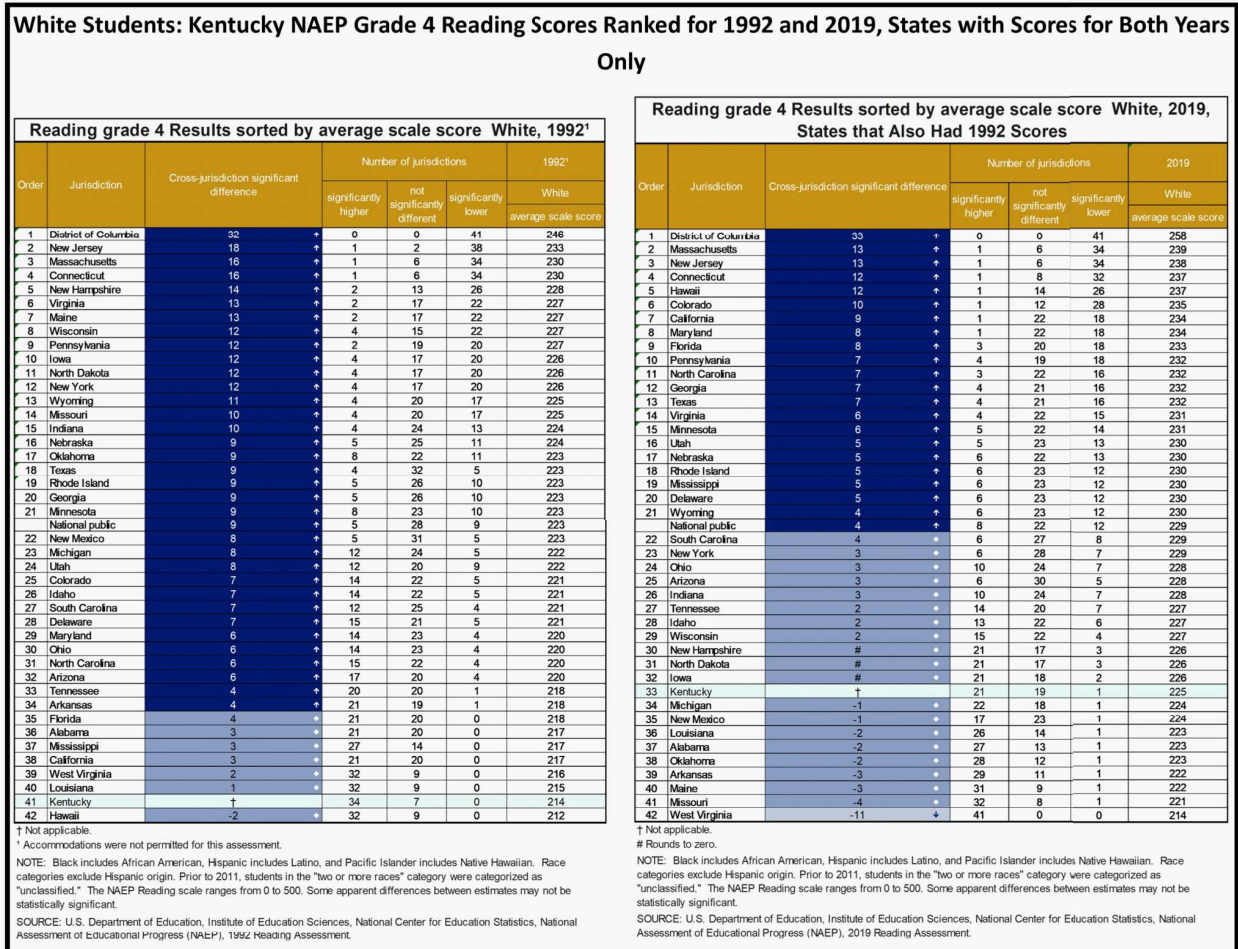
The NAEP Data Explorer also color-codes situations where a state scores lower than the focus state. An example can be seen in the 2019 data section in the lower right side of Figure 2 where one state, West Virginia, scored statistically significantly lower than Kentucky for white public students’ NAEP Grade 4 Reading in 2019.

The next set of columns, those under the “Number of Jurisdictions” header, show the number of states that scored statistically significantly higher, the same as, or statistically significantly lower than the state listed on each row. For the District of Columbia’s white students, in 1992 no state scored statistically significantly higher or the same. All 41 other listed jurisdictions scored statistically significantly lower.

In the case of Kentucky, in 1992 a total of 34 jurisdictions in the listing scored statistically significantly higher and seven tied Kentucky after the sampling errors in the scores are considered. No state scored statistically significantly lower.

Finally, the last column lists the scores in rank order, highest score first. These scores are stored to several decimal places in the NAEP’s computer system so the rankings are in order even though some scores rounded to the nearest point appear to be the same.

Figure 2



EXAMINING GRADE 4 WHITE STUDENTS READING RESULTS

As you can see in Figure 2, a total of 42 jurisdictions (41 states plus the District of Columbia schools) reported results for both listed years. Missing states either didn't participate in 1992 when NAEP was voluntary or had data problems with their student sample.

In 1992, Kentucky ranked in 41st place. That hasn't changed much as of 2019 when Kentucky ranked 33rd. Kentucky's rankings in both 1992 and 2019 clearly are well below "the middle."

In 1992, no state scored statistically significantly lower than Kentucky. By 2019, only West Virginia scored statistically significantly lower, which might mostly be a factor of NAEP increasing its sample sizes over the years to reduce sampling errors rather than much real change.

Surprisingly, in 1992, Mississippi's white students already scored a little higher than Kentucky's, in 37th place, but the score difference wasn't statistically significant.

By 2019, however, Mississippi's white Grade 4 public school students' rank is 19th among the states reporting whites' NAEP scores for both years, outscoring Kentucky's whites by a statistically significant amount, as well. The Mississippi - Kentucky gap for white students in NAEP Grade 4 Reading unquestionably increased.

There appears to be a solid reason for Mississippi's progress. The Magnolia State adopted a new program in 2015 to ensure all its elementary school teachers were teaching reading in accordance with what scientific research shows works best. By 2019, this program was bearing fruit.⁴

Another state worth mentioning is Florida, which over the years has amassed perhaps the most school choice options for students of any state in the nation. Keeping in mind that the scores in Figure 2 only show what's happened in public schools, we see our first example that massive choice in Florida also correlates with significant improvement for that state's white public school Grade 4 students in reading. In 1992 NAEP Grade 4 Reading, Florida's white students only ranked 35th, not much above Kentucky's and with a score not statistically significantly different from Kentucky's. By 2019, Florida's white students significantly increased in the rankings to ninth place while also posting a score statistically significantly higher than Kentucky's whites achieved.

Now let's examine the math picture. Figure 3 shows what the NAEP Data Explorer's tools produced for NAEP Grade 4 Math in 1992 and 2019.

Figure 3

White Students: Kentucky NAEP Grade 4 Math Scores Ranked for 1992 and 2019, States with Scores for Both Years Only

Mathematics Grade 4 Results Sorted by Average Scale Score, White, 1992							Mathematics Grade 4 Results Sorted by Average Scale Score, White, 2019							
Order	Jurisdiction	Cross-jurisdiction significant difference	Number of Jurisdictions			1992 ¹	Order	Jurisdiction	Cross-jurisdiction significant difference	Number of Jurisdictions			2019	
			significantly higher	not significantly different	significantly lower	White average scale score				significantly higher	not significantly different	significantly lower	White average scale score	
1	District of Columbia	+34	0	0	41	251	1	District of Columbia	+30	0	0	41	273	
2	New Jersey	+20	1	1	39	236	2	Minnesota	+15	1	2	38	258	
3	Connecticut	+18	1	3	37	235	3	New Jersey	+12	1	15	25	254	
4	Wisconsin	+16	2	8	31	233	4	Texas	+12	1	16	24	254	
5	Maine	+15	2	12	27	232	5	Florida	+12	2	14	25	254	
6	Massachusetts	+15	3	12	26	231	6	Massachusetts	+11	2	15	24	254	
7	Minnesota	+14	3	12	26	231	7	Virginia	+11	2	19	20	253	
8	Iowa	+14	3	13	25	231	8	Pennsylvania	+10	2	19	20	252	
9	New Hampshire	+14	3	15	23	230	9	Hawaii	+10	2	21	18	252	
10	Pennsylvania	+14	3	16	22	230	10	Connecticut	+10	2	19	20	252	
11	Texas	+13	3	18	20	230	11	Colorado	+9	2	21	18	252	
12	North Dakota	+13	4	14	23	230	12	North Carolina	+9	2	21	18	252	
13	New York	+12	4	20	17	228	13	Maryland	+9	2	21	18	251	
14	Nebraska	+12	4	20	17	228	14	Mississippi	+9	2	21	18	251	
15	Maryland	+12	5	18	18	228	15	Nebraska	+8	2	21	18	251	
16	Virginia	+12	4	22	15	228	16	Indiana	+8	2	21	18	250	
17	Georgia	+11	7	18	16	228	17	Arizona	+8	4	24	13	250	
18	Missouri	+10	8	19	14	227	18	California	+7	2	29	10	250	
19	Wyoming	+10	10	17	14	227	19	Delaware	+7	6	20	15	250	
20	Michigan	+10	8	22	11	227	20	Georgia	+7	6	22	13	249	
21	National public	+10	11	18	13	227	21	South Carolina	+7	6	24	11	249	
22	Colorado	+10	11	17	13	227	22	Wisconsin	+7	6	24	11	249	
23	Delaware	+10	11	17	13	226	23	Wyoming	+7	9	20	12	249	
24	Utah	+9	12	19	10	225	24	Utah	+6	9	21	11	249	
25	Arizona	+8	15	16	10	225	25	National public	+6	13	14	15	249	
26	South Carolina	+8	13	21	7	225	26	Rhode Island	+5	16	17	8	247	
27	New Mexico	+8	12	22	7	224	27	North Dakota	+4	16	17	8	247	
28	Indiana	+8	16	18	7	224	28	Tennessee	+4	16	20	5	247	
29	Oklahoma	+7	19	15	7	224	29	Ohio	+4	17	19	5	246	
30	Florida	+7	17	17	7	224	30	Idaho	+4	17	18	6	246	
31	Idaho	+6	22	12	7	223	31	New Hampshire	+3	23	13	5	246	
32	North Carolina	+6	21	13	7	223	32	Iowa	+3	20	17	4	246	
33	Hawaii	+6	21	16	4	222	33	New York	+3	19	19	3	245	
34	Ohio	+5	24	13	4	222	34	Louisiana	+1	24	15	2	244	
35	Rhode Island	+5	24	13	4	221	35	Missouri	+1	26	12	3	244	
36	California	+4	24	16	1	221	36	New Mexico	+1	24	15	2	243	
37	Mississippi	+2	31	10	0	219	37	Michigan	+1	26	13	2	243	
38	Louisiana	+2	31	10	0	218	38	Oklahoma	+1	27	12	2	243	
39	Alabama	+2	31	10	0	218	39	Maine	#	31	9	1	242	
40	Tennessee	+1	34	7	0	217	40	Kentucky	†	30	10	1	242	
41	Arkansas	+1	34	7	0	217	41	Arkansas	-2	33	7	1	240	
42	West Virginia	-1	35	6	0	216	42	Alabama	-4	37	3	1	239	
								43	West Virginia	-10	41	0	0	232

Again, 42 jurisdictions have scores reported for white students in both years. In 1992, the first administration of State NAEP in Grade 4 Math, Kentucky’s whites ranked 41st. Flash forward to 2019 and Kentucky only moved up to 39th place, which is nowhere near the middle, of course. In fact, it isn’t much improvement at all compared to the other states.

Looking at the statistical significance data, Kentucky only advanced between 1992 and 2019 from having no state scoring lower to now having just one state scoring significantly lower. Again, that isn’t close to middle-of-the-stack performance and the tiny change might mostly be due to NAEP’s

increased sample sizes in more recent testing, which can turn statistical ties into statistically significant differences though no true change is taking place.

In 1992, Mississippi's whites didn't do much better than Kentucky's, ranking 36th per the NAEP Data Explorer. The score difference to Kentucky in 1992 wasn't statistically significant. However, Mississippi made major progress during the interim, now ranking 14th and scoring statistically significantly higher than Kentucky. While the Bluegrass State slept, its white students lost notable ground to Mississippi's in Grade 4 math. More research on the math issue is needed, but this might be due to a combination of Mississippi fourth graders being able to read their math texts more fluently plus other reforms Mississippi enacted, principally in 2013.

Florida also made massive improvement for its public school NAEP Grade 4 Math results for white students, moving from 29th to fifth place. School choice didn't hurt white students in the Sunshine State's public schools.

Now, let's look at results from the Grade 8 NAEP. State NAEP testing for reading in this grade started a little later, in 1998.

Figure 4

White Students: Kentucky NAEP Grade 8 Reading Scores Ranked for 1998 and 2019, States with Scores for Both Years Only

Reading Grade 8 Results Sorted by Average Scale Scores, Whites, 1998

Order	Jurisdiction	Cross-jurisdiction significant difference	Number of jurisdictions			1998 White average scale score
			significantly higher	not significantly different	significantly lower	
1	Connecticut	+12	0	4	31	277
2	New York	+10	0	9	26	275
3	Massachusetts	+10	0	13	22	274
4	Virginia	+9	0	13	22	273
5	Montana	+9	1	13	21	273
6	Maine	+8	1	17	17	272
7	Kansas	+8	1	18	16	272
8	Maryland	+8	0	22	13	272
9	Texas	+7	1	19	15	271
10	North Carolina	+6	1	19	15	270
11	Colorado	+6	2	18	15	270
12	New Mexico	+5	2	19	14	270
13	Arizona	+5	5	16	14	269
14	Minnesota	+5	2	23	10	269
15	Wisconsin	+5	2	22	11	269
16	Oregon	+5	4	22	9	269
17	Oklahoma	+4	5	23	7	268
18	Rhode Island	+4	6	18	11	268
	National public	+4	5	23	8	268
19	California	+4	5	26	4	268
20	Georgia	+3	5	26	4	268
21	Washington	+3	7	24	4	267
22	Utah	-1	12	22	1	266
23	Missouri	+1	10	25	0	265
24	South Carolina	+1	15	20	0	265
25	Wyoming	+1	13	22	0	265
26	Alabama	+1	13	22	0	265
27	Tennessee	#	10	19	0	264
28	Kentucky	†	17	18	0	264
29	Florida	#	18	17	0	264
30	Nevada	#	18	17	0	264
31	Mississippi	#	18	17	0	264
32	Arkansas	1	21	14	0	263
33	Delaware	-1	21	14	0	263
34	Louisiana	-2	21	14	0	262
35	West Virginia	-2	22	13	0	262
36	Hawaii	-2	17	18	0	262

Reading Grade 8 Results Sorted by Average Scale Scores, Whites, 2019

Order	Jurisdiction	Cross-jurisdiction significant difference	Number of jurisdictions			2019 White average scale score
			significantly higher	not significantly different	significantly lower	
1	Massachusetts	+13	0	4	31	279
2	Connecticut	+13	0	4	31	279
3	Colorado	+11	0	8	27	277
4	Maryland	+11	0	12	23	277
5	Washington	+9	2	14	19	275
6	Rhode Island	+8	2	14	19	275
7	California	+8	0	25	10	274
8	Wisconsin	+8	2	15	18	274
9	Florida	+7	2	18	15	273
10	Arizona	+7	3	19	13	273
11	Utah	+7	4	16	15	273
12	North Carolina	+6	3	21	11	272
13	Georgia	+6	3	22	10	272
14	New York	+6	4	24	7	272
15	Minnesota	+5	4	23	8	271
16	National public	+5	7	16	13	271
17	Hawaii	+5	3	29	3	271
18	Virginia	+5	4	28	3	271
19	Delaware	+5	6	23	6	271
20	South Carolina	+4	7	25	3	270
21	Montana	+3	9	23	3	269
22	Oregon	+3	7	25	3	269
23	Nevada	+3	7	26	2	269
24	Tennessee	+2	10	23	2	268
25	Louisiana	+2	9	24	2	268
26	Mississippi	+2	10	23	2	268
27	Wyoming	+2	15	18	2	268
28	Kansas	+2	13	20	2	268
29	Missouri	+1	14	19	2	267
30	Texas	+1	11	22	2	267
31	Maine	+1	16	17	2	267
32	New Mexico	#	13	21	1	266
32	Kentucky	†	16	17	2	266
33	Arkansas	#	16	17	2	266
34	Oklahoma	-1	21	13	1	265
35	Alabama	-5	32	2	1	261
36	West Virginia	-10	35	0	0	256

† Not applicable.
Rounds to zero.
NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Prior to 2011, students in the "two or more races" category were categorized as "unclassified." The NAEP Reading scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

† Not applicable.
Rounds to zero.
NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Prior to 2011, students in the "two or more races" category were categorized as "unclassified." The NAEP Reading scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Reading Assessment.

During the first year of State NAEP Grade 8 Reading in 1998, Kentucky ranked 28th among the 36 jurisdictions that reported white student scores in that year.

In 2019, among the same 36 jurisdictions, Kentucky's rank for white Grade 8 reading went backwards. Clearly, placing only 32nd out of 36 jurisdictions as of 2019 isn't middle-of-the-stack performance.

Oddly, Kentucky's white Grade 8 students in 2019 outscored whites in two states after outscoring none by a statistically significant amount in 1998; still, Kentucky is clearly performing in the bottom tier. Again, this slight change in states statistically significantly outscored is possibly mostly due to better sampling by the NAEP in recent years rather than any true improvement.

Kentucky and Mississippi also flip-flopped along the way in NAEP Grade 8 Reading. Mississippi's white students ranked 31st place in 1998 NAEP Grade 8 Reading, below Kentucky's 28th place for white students' scores. By 2019, Mississippi's whites ranked 25th, exceeding Kentucky's white students' 32nd place position, though the score differences are not statistically significantly different in either year.

Florida also did an impressive flip-flop. In 1998, Florida ranked one slot below Kentucky for white public school Grade 8 NAEP Reading. By 2019, Florida's white public school kids were on the move, rising to ninth place while statistically significantly outscoring Kentucky.

Now, we finish our white student analyses with a look at NAEP Grade 8 Math performance for public school whites, shown in Figure 5.

Figure 5



In 1992, the first time Mississippi participated in Grade 8 NAEP Math, Kentucky's ranking was a bottom-tier 36th out of 41 jurisdictions with scores. In 2019, Kentucky's white students placed even lower at 39th place.

Kentucky did outscore one state by a statistically significant amount in 2019 for public school NAEP Grade 8 Math, unchanged from the situation in 1992.

By contrast, Mississippi's No. 40 ranking for white public school students on NAEP Grade 8 Math in 1992 was a bit lower than Kentucky's ranking but not by a statistically significant amount. By 2019, however, Mississippi notably flip-flopped with Kentucky again, now scoring 26th while also statistically significantly outscoring Kentucky.

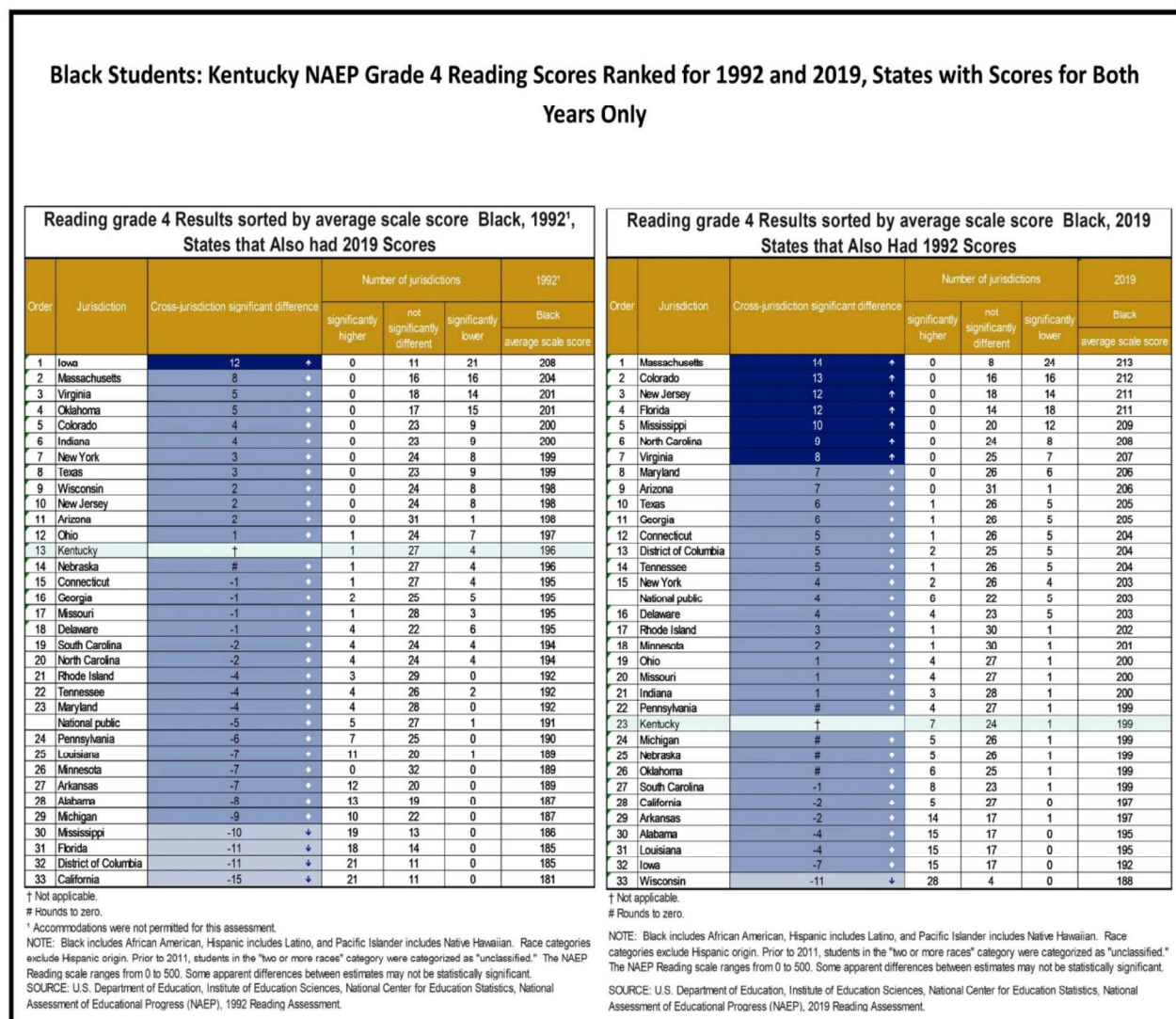
Florida also rose a bit in the rankings, shifting up from 27th to 23rd place for public school white student scores on NAEP Grade 8 Math, statistically significantly outscoring Kentucky in both years.

Now, let's examine the picture for Black students' scores.

BLACK STUDENT STATE RANKINGS OVER TIME

Again, 1992 was the first year a State NAEP in Grade 4 Reading was conducted; participation was voluntary. Some states did not participate. Some other states had low numbers of Black students, so NAEP didn't get enough of those students in its samples. As a result of these factors, a total of only 32 states plus the District of Columbia's school system (or 33 jurisdictions) had Black student scores reported both in 1992 and in 2019, the most recent testing available. Figure 6 shows information for states that have data for both years.

Figure 6



In 1992, the NAEP Data Explorer ranked Kentucky's Black students in 13th place. Perhaps surprisingly, only one state had a Black public school student Scale Score statistically significantly higher than Kentucky in 1992 NAEP Grade 4 Reading. Meanwhile, Kentucky's Black fourth graders scored statistically significantly higher than those in four other states. Due to relatively large sampling errors in Black students' scores, Kentucky was statistically tied with 27 out of the total of 33 jurisdictions.

That got turned around a bit by 2019. In the most recent testing, the NAEP Data Explorer shows Kentucky's Grade 4 public school Black students scored 23rd in reading, about a third of the way from the bottom and certainly well below the middle. Now, seven states statistically significantly outscore the Bluegrass State for Black NAEP Grade 4 Reading results. Most revealing, Kentucky's Black students in 2019 only outscore one other state by a statistically significant amount.

Not only are Kentucky's Black students' 2019 results not middle of the pack, but Kentucky's Black students clearly lost ground in NAEP Grade 4 Reading between the early days of KERA and the most recent data point.

Talking about ground lost, consider how Blacks in Kentucky and Mississippi seriously flip-flopped in public school NAEP Grade 4 Reading between 1992 and 2019. Mississippi's Black students trounced Kentucky's, moving from 30th place in 1992 to fifth in 2019. Mississippi's Blacks also statistically significantly outscored Kentucky's in 2019.

Florida's Black public school students also did a number on Kentucky's in NAEP Grade 4 Reading. In 1992, Florida's Blacks only ranked 31st; by 2019 they had moved up dramatically to fourth place. Along the way, Florida's Black students moved dramatically from scoring statistically significantly lower than Kentucky's Blacks to scoring statistically significantly higher.

Now we look at Black Grade 4 math on the NAEP using Figure 7.

Figure 7 demonstrates the picture for Kentucky is even worse in NAEP Grade 4 Math for Black students than the reading situation.

It probably surprises many that in 1992, Kentucky's Blacks ranked at the top against their peers in other states for NAEP Grade 4 Math. No state scored statistically significantly higher; 11 scored statistically significantly worse.

Unfortunately, Kentucky by 2019 again was below the middle of the pack and the state's Black students only statistically significantly outscored counterparts in five other states and were outscored by six, another clear decline in relative performance since KERA began.

Talking flip-flops, public school Blacks in Mississippi rose from 27th place in 1992 to fifth place on the 2019 NAEP Grade 4 Math for Black students. Mississippi's Blacks also statistically significantly outscored Kentucky's in 2019.

The flip-flop involving the performance of Florida's Black Grade 4 students between 1992 and 2019 is even more dramatic. In 1992, Florida was near the bottom, ranking 26th out of the 33 jurisdictions with scores for both years, scoring statistically significantly lower than Kentucky. Flash forward to 2019 and Florida's Black students rose all the way to second in the nation, while also statistically significantly outscoring Kentucky. Having a lot of school choice certainly didn't hold back Black students in Florida's traditional schools. It seems likely that choice created competitive pressures in Florida that led to improvement in the state's traditional schools far better than Kentucky has achieved.

Figure 7

Black Students: Kentucky NAEP Grade 4 Math Scores Ranked for 1992 and 2019, States with Scores for Both Years Only

Mathematics Grade 4 Results Sorted by Average Scale Score, Black, 1992

Order	Jurisdiction A, B	Cross-jurisdiction significant difference	Number of jurisdictions			1992
			significantly higher	not significantly different	significantly lower	Black average scale score ▲▼
1	West Virginia	+1	0	31	1	201
2	Oklahoma	+1	0	21	11	201
3	Kentucky	†	0	21	11	200
4	Arizona	-1	0	26	6	199
5	Texas	-1	0	21	11	199
6	Colorado	-1	0	24	8	199
7	Virginia	-1	0	21	11	199
8	New Jersey	-2	0	25	7	198
9	New York	-3	0	25	7	197
10	Delaware	-3	0	24	8	197
11	Georgia	-4	0	24	8	196
12	Indiana	-4	0	26	6	196
13	Missouri	-5	0	30	2	195
14	Wisconsin	-5	0	31	1	195
15	Connecticut	-5	0	31	1	195
16	Massachusetts	-5	0	31	1	195
17	Maryland	-5	0	28	4	195
18	South Carolina	-6	0	26	6	194
19	Ohio	-6	0	31	1	194
20	Pennsylvania	-6	0	31	1	194
21	Minnesota	-7	0	32	0	193
22	North Carolina	-7	4	27	1	193
	National public	-8	4	28	1	192
23	Rhode Island	-8	0	32	0	191
24	Tennessee	-9	4	28	0	191
25	Nebraska	-9	4	28	0	191
26	Florida	-11	7	25	0	189
27	Mississippi	-11	10	22	0	189
28	District of Columbia	-11	13	19	0	189
29	Alabama	-12	13	19	0	188
30	Arkansas	-12	12	20	0	188
31	Louisiana	-13	14	18	0	187
32	Michigan	-15	11	21	0	185
33	California	-18	21	11	0	182

† Not applicable.
Accommodations were not permitted for this assessment.
 NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Prior to 2011, students in the "two or more races" category were categorized as "unclassified." The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992 Mathematics Assessment.

Mathematics Grade 4 Results Sorted by Average Scale Score, Black, 2019

Order	Jurisdiction A, B	Cross-jurisdiction significant difference	Number of jurisdictions			2019
			significantly higher	not significantly different	significantly lower	Black average scale score ▲▼
1	Texas	+10	0	9	23	233
2	Florida	+10	0	9	23	233
3	Massachusetts	+9	0	13	19	232
4	Virginia	+9	0	14	18	232
5	Mississippi	+7	0	15	17	230
6	New Jersey	+7	0	21	11	230
7	Rhode Island	+4	0	24	8	227
8	Tennessee	+4	2	21	9	227
9	North Carolina	+4	2	21	9	227
10	Connecticut	+3	0	25	7	227
11	Minnesota	+3	0	27	5	226
12	District of Columbia	+3	5	18	9	226
13	Delaware	+2	5	19	8	225
14	Maryland	+1	5	20	7	224
15	California	+1	3	24	5	224
	National public	+1	8	17	8	224
16	Georgia	+1	5	22	5	224
17	Colorado	+1	0	30	2	224
18	Arizona	#	2	28	2	223
19	Indiana	#	2	28	2	223
20	Kentucky	†	6	21	5	223
21	Oklahoma	#	4	26	2	223
22	Ohio	-2	5	26	1	221
23	Pennsylvania	-2	5	26	1	221
24	South Carolina	-3	11	18	3	220
25	Nebraska	-3	9	22	1	220
26	Louisiana	-4	13	18	1	219
27	New York	-5	13	19	0	218
28	West Virginia	-5	6	26	0	218
29	Missouri	-7	17	15	0	216
30	Arkansas	8	17	15	0	215
31	Alabama	-8	18	14	0	215
32	Michigan	-10	22	10	0	213
33	Wisconsin	-11	26	6	0	212

† Not applicable.
Rounds to zero.
 NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Prior to 2011, students in the "two or more races" category were categorized as "unclassified." The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Mathematics Assessment.

It's much the same story regarding Kentucky's performance on the State NAEP Grade 8 Reading. Figure 8 shows what happened for this grade and subject.

In 1998, Kentucky's Blacks still scored above the middle of the pack and no state had a statistically significantly higher score. By 2019, Kentucky's Black Grade 8 students dropped to only about a third off the bottom of the stack and now four states score statistically significantly higher while no state scores statistically significantly lower. This isn't middle of the pack performance; it's definitely ranking decay for Kentucky's Black students.

Mississippi's Black students pulled off yet another flip-flop with Kentucky's in the rankings, moving from 19th to 11th. Florida also pulled off a flip-flop, moving from 23rd place in 1998 NAEP Grade 8 Reading for public school Black students to ranking fifth by 2019, well ahead of Kentucky.

Figure 8

Black Students: Kentucky NAEP Grade 8 Reading Scores Ranked for 1998 and 2019, States with Scores for Both Years Only

Reading Grade 8 Results Sorted by Average Scale Score, Black, 1998

Order	Jurisdiction	Cross-jurisdiction significant difference	Number of jurisdictions			1998
			significantly higher	not significantly different	significantly lower	Black average scale score
1	Oklahoma	+7	0	14	14	253
2	Virginia	+4	0	16	12	250
3	Kansas	+4	0	28	0	249
4	West Virginia	+3	0	28	0	248
5	Arizona	+3	0	25	3	248
6	Colorado	+3	0	25	3	248
7	Massachusetts	+1	0	27	1	246
8	New York	+1	0	22	6	246
9	Rhode Island	#	0	28	0	246
10	Texas	#	0	25	3	246
11	Kentucky	†	0	25	3	246
12	Connecticut	-1	0	25	3	245
13	Washington	-3	0	28	0	242
14	Missouri	-4	1	27	0	242
	National public	-4	2	24	3	242
15	Nevada	-4	1	27	0	241
16	Georgia	-5	2	26	0	241
17	South Carolina	-6	2	26	0	240
18	Maryland	-6	2	26	0	240
19	Mississippi	-7	2	26	0	238
20	California	-8	2	26	0	238
21	Alabama	-9	3	25	0	237
22	Louisiana	-9	3	25	0	236
23	Florida	-10	3	25	0	236
24	Tennessee	-10	2	26	0	235
25	Delaware	-11	8	20	0	234
26	Wisconsin	-11	0	28	0	234
27	Arkansas	-12	8	20	0	234
28	District of Columbia	-13	9	19	0	233
29	Minnesota	-14	0	28	0	231

† Not applicable.
Rounds to zero.
NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Prior to 2011, students in the "two or more races" category were categorized as "unclassified." The NAEP Reading scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 Reading Assessment.

Reading Grade 8 Results Sorted by Average Scale Score, Black, 2019

Order	Jurisdiction	Cross-jurisdiction significant difference	Number of jurisdictions			2019
			significantly higher	not significantly different	significantly lower	Black average scale score
1	Massachusetts	+19	0	6	22	259
2	Maryland	+12	0	15	13	251
3	Connecticut	+11	0	20	8	251
4	Georgia	+10	0	17	11	249
5	Florida	+8	0	24	4	248
6	New York	+8	1	23	4	248
7	Rhode Island	+7	0	28	0	247
8	Colorado	+7	0	28	0	246
9	Tennessee	+6	2	22	4	246
10	Delaware	+6	1	24	3	246
11	Mississippi	+5	3	23	2	244
12	Oklahoma	+5	1	27	0	244
	National public	+4	3	22	4	244
13	Kansas	+4	1	27	0	244
14	Virginia	-4	2	26	0	243
15	Nevada	-3	1	27	0	243
16	Louisiana	+3	3	25	0	242
17	South Carolina	-3	3	25	0	242
18	District of Columbia	+1	5	23	0	241
19	Missouri	+1	1	27	0	240
20	Kentucky	†	4	24	0	239
21	Alabama	#	4	24	0	239
22	Arizona	#	1	27	0	239
23	West Virginia	-1	1	27	0	239
24	Texas	-2	8	20	0	238
25	Arkansas	-2	9	19	0	237
26	Minnesota	-4	6	22	0	236
27	Washington	-4	1	27	0	236
28	California	-4	4	24	0	236
29	Wisconsin	-5	9	19	0	235

† Not applicable.
Rounds to zero.
NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Prior to 2011, students in the "two or more races" category were categorized as "unclassified." The NAEP Reading scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Reading Assessment.

Finally, Figure 9, which shows Kentucky's Black students' performance on NAEP Grade 8 Math, is largely a replication of Figures 6 to 8.

Figure 9

Black Students, Kentucky NAEP Grade 8 Math Scores Ranked for 1992 and 2019, States with Scores for Both Years Only

Mathematics Grade 8 Results Sorted by Average Scale Score, Black 1992							Mathematics Grade 8 Results Sorted by Average Scale Score, Black 2019						
Order	Jurisdiction $\Delta \updownarrow$	Cross-jurisdiction significant difference	Number of jurisdictions			1992 Black average scale score $\Delta \updownarrow$	Order	Jurisdiction $\Delta \updownarrow$	Cross-jurisdiction significant difference	Number of jurisdictions			2019 Black average scale score $\Delta \updownarrow$
			significantly higher	not significantly different	significantly lower	1992 Black average scale score $\Delta \updownarrow$				significantly higher	not significantly different	significantly lower	2019 Black average scale score $\Delta \updownarrow$
1	Maine	+9	0	0	32	270	1	Virginia	+12	0	11	21	268
2	Arizona	+12	1	12	19	253	2	Massachusetts	+11	0	21	11	267
3	Virginia	+4	1	20	11	245	3	Arizona	+11	0	21	11	267
4	Wisconsin	+4	1	31	0	245	4	New Jersey	+10	0	23	9	266
5	Massachusetts	+3	1	31	0	243	5	Texas	+9	0	20	12	265
6	Texas	-2	1	24	7	243	6	North Carolina	+8	0	21	11	264
7	West Virginia	+2	1	29	2	242	7	Georgia	+6	0	22	10	262
8	New Jersey	+1	1	25	6	242	8	Indiana	+6	0	30	2	262
9	Connecticut	+1	1	26	5	242	9	West Virginia	+5	0	30	2	261
10	Missouri	+1	1	28	3	242	10	Colorado	+5	0	29	3	261
11	Colorado	-1	1	31	0	242	11	Maryland	+5	1	25	6	261
12	Delaware	+1	2	24	6	241	12	Tennessee	+4	1	28	3	260
13	Indiana	+1	1	27	4	241	13	District of Columbia	+4	1	26	5	260
14	Kentucky	†	2	26	4	241	14	Delaware	+4	1	28	3	260
15	South Carolina	#	2	24	6	241	15	Florida	+4	1	29	2	259
16	Georgia	#	2	24	6	241	16	National public	+3	2	27	4	259
17	Rhode Island	#	2	28	2	240	17	Ohio	+3	1	29	2	259
18	Maryland	-2	2	27	3	239	18	Mississippi	+3	2	28	2	258
19	Oklahoma	-2	2	29	1	238	19	Rhode Island	+3	0	32	0	258
20	North Carolina	-2	3	26	3	238	20	New York	+2	1	29	2	258
21	Pennsylvania	-3	1	31	0	238	21	Missouri	+2	1	29	2	258
22	Nevada	-4	1	31	0	237	22	Connecticut	+1	1	31	0	256
23	National public	-5	3	29	1	236	23	Kentucky	†	6	26	0	256
24	Florida	-5	3	29	0	236	24	South Carolina	#	7	23	2	256
25	Tennessee	-7	4	28	0	234	25	Louisiana	-1	9	23	0	255
26	Ohio	-7	3	29	0	234	26	Pennsylvania	-1	6	26	0	255
27	New York	-7	2	30	0	233	27	Maine	-1	0	32	0	255
28	California	-8	3	29	0	233	28	Michigan	-3	7	25	0	253
29	Michigan	-8	9	23	0	233	29	Oklahoma	-3	8	24	0	253
30	Louisiana	-8	8	24	0	232	30	California	-3	6	26	0	252
31	District of Columbia	-9	13	19	0	232	31	Nebraska	-4	9	23	0	252
32	Alabama	-11	12	20	0	230	32	Wisconsin	-6	12	20	0	250
33	Mississippi	-11	17	15	0	230	33	Alabama	-7	20	12	0	249
34	Arkansas	-11	16	16	0	229	34	Arkansas	-7	20	12	0	249

In 1992, the first time Mississippi participated in NAEP Grade 8 Math, Kentucky's public school Blacks outscored Black students in four other states that have scores for both 1992 and 2019. By 2019, not a single state scores statistically significantly lower than the Bluegrass State for Black students.

And, Mississippi again has pulled a flip-flop on Kentucky, rising from 32nd to 17th place in NAEP Grade 8 Math while Kentucky went the other way.

Florida moved from 23rd to 15th in the same period, again flip-flopping positions with Kentucky.

SUMMARIZING

The reality of Kentucky public education's disturbing performance compared to the rest of the nation needs to be kept in mind as state lawmakers and the court system try to work through challenges to improve the situation.

Hampering that decision process is the fact that too many people operate under the false assumption that Kentucky used to score at the bottom among the states but has now worked its way up to performing at the middle of the pack. The NAEP analyses above dramatically demonstrates this is absolutely not the case, and the need for reforms is far more serious than such incorrect assumptions imply.

In fact, while Kentucky's education system largely slept, Mississippi, a state too many in Kentucky inappropriately hold in low esteem, moved ahead – often by a lot.

And Florida, which is sort of the poster-child state for school choice, also left Kentucky's public school system very solidly in its wake, as well.

To be sure, Kentucky's NAEP scores did rise a bit. However, other states' scores for both white and Black students also rose notably, and Kentucky's rankings often suffered accordingly.

This performance picture raises a lot of questions. Should Kentucky generally just continue with policies like School Based Decision-Making management unchanged and without the kinds of school choice found in many of the states that have moved ahead of Kentucky for both white and Black student results? Is maintaining largely a status quo in Kentucky's public education system the right thing to do for our children?

Legislators and justices, the ball is in your court. For the sake of our children, please don't fumble it.

Richard G. Innes is an education analyst with the Bluegrass Institute for Public Policy Solution, Kentucky's first and only free market think tank.

Appendix 1

ABOUT THE NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS (NAEP)

This discussion will help the reader gain increased understanding why the analysis approach in this paper is appropriate and how some folks relying on shallow analyses of NAEP data have come to the faulty conclusion that Kentucky's public education system made notable improvements during the three decades that KERA has been in place.

To begin, the NAEP, which bills itself as "The Nation's Report Card," comprises a number of different types of testing and has been in use since 1969.⁵

However, early NAEP testing only provided a nationwide set of scores. No state-level results were included. Testing allowing comparisons of state-to-state performance of education systems didn't begin until the introduction of the Trial State NAEP Grade 8 Mathematics Assessment in 1990.⁶ That first state NAEP effort was joined in 1992 by more state-level NAEP administrations, in what came to be called the "Main NAEP,"⁷ with another administration of Grade 8 math plus Grade 4 administrations in both math and reading. Main NAEP in Grade 8 Reading would be added in 1998 and testing in other subjects would follow.

Initially, the testing intervals for Main NAEP varied, sometimes stretching out to four years (e.g., NAEP Grade 4 Reading was given in 1994, 1998 and 2002 while Grade 4 NAEP Math was given in 1992, 1996 and 2000).⁸

Also, state participation in math and reading during the early years before 2003 was voluntary; in none of those years was there participation by all states in any administration.

Later, the passage of No Child Left Behind (NCLB) led to State NAEP Testing in math and reading for Grades 4 and 8 to be conducted every two years beginning in 2003 through 2019. Full participation in NAEP by all the states also occurred after NCLB was enacted. COVID-19 impacted the NAEP schedule after 2019 and the next Main NAEP results for math and reading are not expected before the fall of 2022. The 2019 NAEP results were collected before COVID-19 hit the country.

Data collected by the NAEP also has varied over time. One key example was data about scores for students eligible for the federal free and reduced-cost school lunch program was not available in Main State NAEP testing until 1996.⁹

Another issue with NAEP's school lunch data was created around 2015 by the establishment of the federal school lunch Community Eligibility Program (CEP) by the US Department of Agriculture, which administers this program. Under the CEP, if just 40% of the students in a school are needs-based eligible for school lunches, the school can elect to serve all its students, including the very wealthiest, with this federal program.¹⁰ Unfortunately, the CEP program creates a currently unsolved reporting problem for the NAEP. At present, there is no standardization in the NAEP's school lunch score reports to ensure that only truly needs-based students are included. In fact, the actual reporting of lunch eligibility by each state to the NAEP seems to vary considerably and the people administering the NAEP at the National Center for Education Statistics have no idea which states currently report only true needs-based students as lunch eligible. Thus, what used to be the best indicator of poverty in the NAEP data cannot be confidently used at present to explore the important question of how students of modest means perform.

NAEP has a number of other important limitations that also impact analysis.

For one, the NAEP only tests a sample of students from each state. For example, in Kentucky, which had a public school fourth-grade enrollment of around 49,000 in 2019, NAEP only pulled a sample of about 3,200 students to actually test.¹¹ NAEP's selection of students for testing uses a complex,

multi-step random sampling process that first selects schools, and then students within those schools who will be tested. Sampling, of course, means the scores have plus and minus sampling errors in them and are only estimates, at best, of actual performance.

Furthermore, NAEP question booklets are assembled in a way so each student only answers a subset of the total questions asked. This is done to ensure each student's work is insufficient to develop a valid assessment of a specific student's performance (federal law prohibits releasing NAEP results for students and individual schools) and to keep testing time to a minimum.

Because individual students provide incomplete evidence about their academic capability, to even begin to develop a reasonable estimate of average student performance, many students' results must be averaged together. This testing approach, called matrixing, is one reason scores cannot be confidently estimated when only a small number of students from a student group are present in a NAEP sample. An example would be scores for Hispanic students in early State NAEP testing in Kentucky. In such cases where the NAEP sample is insufficient to provide reasonable estimates of group performance, the NAEP suppresses those scores.

Fortunately, the NAEP offers several tools, including the NAEP Data Explorer web tool, which allow meaningful analyses of scores with such sampling errors present.

NAEP LIMITATIONS' IMPACTS ON THIS STUDY

The issues above explain why in the early years of Main State NAEP, Kentucky didn't have Hispanic student score reports. Due to the absence of Hispanic scores for Kentucky in the early years of Main NAEP, the long-term analyses in this paper cannot include Hispanic performance as the required data does not exist.

Because of its sampling approach and due to sometimes highly variable student demographics found from state to state, even when a state did participate in the Main State NAEP, it might not have scores for Black students. This explains why the number of states included in the analyses of white students' performances is notably larger than the number of states that can be examined for Black students' performances.

Due to the absence of early years of data and now the additional corrupting influence of the changes in the federal school lunch program, a valid analysis of performance over time for low-income students is also not possible with the NAEP.

ENDNOTES

- ¹ The NAEP Data Explorer web tool is here: <https://www.nationsreportcard.gov/ndecore/landing>.
- ² National Center for Education Statistics, “The Nation’s Report Card: Science 2009,” (NCES 2011–451), Institute of Education Sciences, U.S. Department of Education, Washington, D.C., 2011, Page 32. <https://nces.ed.gov/nationsreportcard/pdf/main2009/2011451.pdf>.
- ³ For example, see the footnote to the bottom graph on Page 4 in: Education Trust, Inc., “Education Watch Alabama,” Winter 2002-2003. https://edtrust.org/wp-content/uploads/2013/10/AL_statesum.pdf#:~:text=Note%3AA%20difference%20of%2010%20points%20is%20roughly%20equivalent,of%20the%20pack%20among%20states%20in%20NAEP%20reading.
- ⁴ More on the Mississippi reading situation is found in: Innes, Richard, “What Milton Wright knew about reading instruction, but lots of teachers apparently don’t,” Bluegrass Institute for Public Policy Solutions, July 2021. https://static1.squarespace.com/static/5f986190ec1e7d424e58d7f2/t/60eb5427db8bb141baf01ff5/1626035240080/Report+MiltonWright.pdf?mc_cid=c764432684&mc_eid=fbac46c0fb.
- ⁵ National Center for Education Statistics, “About the Nation’s Report Card,” Undated. <https://www.nationsreportcard.gov/about.aspx>.
- ⁶ National Center for Education Statistics, “History and Development: National Assessment of Educational Progress (NAEP) State Assessments,” Undated. <https://nces.ed.gov/nationsreportcard/about/state.aspx>.
- ⁷ National Center for Education Statistics, “From The NAEP Primer: A Technical History of NAEP,” Undated. <https://nces.ed.gov/nationsreportcard/about/newnaephistory.aspx#beginning>.
- ⁸ These example dates were extracted from the NAEP Data Explorer.
- ⁹ Determination of the first year where lunch data was available was made using the NAEP Data Explorer.
- ¹⁰ US Department of Agriculture, “The Community Eligibility Provision (CEP), What Does It Mean For Your School or Local Educational Agency?” Undated. <https://fns-prod.azureedge.us/sites/default/files/cn/CEPfactsheet.pdf>.
- ¹¹ National Center for Education Statistics, “2019 Reading Grades 4 and 8 Assessment Report Cards: Summary Data Tables for National and State Sample Sizes, Participation Rates, Proportions of SD and ELL Students Identified, and Types of Accommodations,” Undated, Table A3. https://www.nationsreportcard.gov/reading/supportive_files/2019_technical_appendix_reading.pdf.

<https://static1.squarespace.com/static/5f986190ec1e7d424e58d7f2/t/6255a5844f74d3326869e889/1649780106820/While+Kentucky%E2%80%99s+education+system+was+sleeping+....pdf>

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