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## Kentucky Ranks 32nd on Education Index

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*Kentucky's educational status has improved dramatically since the early 1990s.*

Kentucky's national educational rank has improved dramatically since the early 1990s. Based on multiple educational attainment and achievement factors that we combine into a single index, Kentucky climbed to 32nd in 2009. This represents a marked improvement from 43rd in 1992. The index shows that Kentucky has made educational improvements over the years and gained ground on other states. Only two states that were in the bottom ten in 1992 had managed to climb out of that group by 2009—Kentucky and North Carolina (see Table 1).

	1992	2009
New Mexico	41	48
North Carolina	42	34
<b>Kentucky</b>	<b>43</b>	<b>32</b>
South Carolina	44	41
Tennessee	45	40
West Virginia	46	47
Arkansas	47	42
Alabama	48	44
Louisiana	49	49
Mississippi	50	50

*Source: KLTPrC calculations based on multiple data sources*

*The index includes educational attainment and achievement measures.*

The indicators that comprise the index measure educational attainment, such as high school and college attainment percentages, as well as educational achievement, including the percentage of students scoring proficient or higher on the various National Assessment of Educational Progress (NAEP) reading, math, and science exams. We use seven indicators for the 1992 index and eleven for 2009 (see Table 2).

	1992		2009	
	Value	Rank	Value	Rank
HS Diploma or Higher*	77%	46	87%	42
Two-Year Degree or Higher*	22%	45	34%	45
Bachelor's Degree or Higher*	18%	44	24%	45
9-12th Grade Dropout Rates**	-	-	3%	12
ACT State Composite Scores	20.0	40	19.4	48
8th Grade Math NAEP***	14%	40	27%	38
8th Grade Reading NAEP	-	-	33%	19
8th Grade Science NAEP†	-	-	31%	22
4th Grade Math NAEP	13%	42	37%	35
4th Grade Reading NAEP	23%	40	36%	11
4th Grade Science NAEP†	-	-	36%	8

\*Percentage of adults 25 to 64 years old  
 \*\*2007 data  
 \*\*\*The six NAEP indicators show the percentage of students scoring proficient or higher.  
 †2005 data  
 Note: A dash (-) in a cell indicates that data are not available.  
 Source: KLTPrC calculations based on multiple data sources

*Despite a drop in ACT score, improvements in NAEP scores and the dropout rate have helped further elevate Kentucky's rank from 35th in 2007.*

While Kentucky's ACT composite score decreased from 20.9 in 2008 to 19.4 in 2009,<sup>1</sup> improvements in fourth and eighth grade NAEP reading scores, fourth grade NAEP math scores, and the dropout rate<sup>2</sup> have elevated Kentucky's national rank in recent years as it moves up from 35th in 2007.<sup>3</sup> These improvements helped Kentucky gain ground on North Carolina, which remained at its 2007 rank of 34th.

*Caveats*

There are at least four caveats to this index. First, as mentioned above, not all of the indicators used in 2009 were available in 1992. Consequently, when making comparisons between years one should be aware of data availability. Second, there are, undoubtedly, fundamentally important indicators not included in the index, such as those that measure achievement gaps. Third, we give equal weight to each indicator, but, arguably, some indicators are probably more important. However, due to its somewhat subjective nature, any weighting scheme would have its own limitations. Fourth, while rankings are ideal for determining the relative positions of states, they reveal nothing about the *distance* between states. Knowing that Kentucky is 32nd and Massachusetts is 1st does not reveal how near or far Kentucky is from Massachusetts. Table 3, however, shows how Kentucky's values compare to the average for the top ten states, which is illustrative of how far Kentucky must go before reaching the upper echelon of "smart states."



Method

Compared to our past and relative to the nation, these data show substantial educational progress. Since 1992, the Commonwealth has improved its place among states from the bottom fifth to the middle third. Although the state has made progress and appears to be continuing its upward climb, there is a substantial achievement and attainment gap between Kentucky and the top ten states—indicating there is still much work to be done.

The Education Index combines seven to eleven education indicators covering 1992 to 2009, including measures of educational attainment and achievement.<sup>4</sup> The index uses summary statistical information about each indicator to construct a number ranging from 0 to 1 that expresses how each state’s measure compares to other states. The higher the score, the better a state ranks among the states. The final index score is the average of eleven indicator scores.

The indicators were standardized to facilitate their comparison with each other and their combination into one summary statistic. By transforming all outcomes to Z-scores, with the same mean (0) and standard deviation (1), all of the indicators could be compared and combined using a common yardstick. Although the use of standardized outcome measures provides a common yardstick with which to compare and combine the different indicator measures, it still is not completely satisfying for the purpose of presentation. This drawback is attributable to the fact that standardized outcomes can take on an infinite range of values that indicate only the direction and number of standard deviations of the difference between the given score and the mean score for the particular outcome. In contrast, the probability values associated with the standardized outcome scores represent a measure with more intuitive appeal. They range from 0 to 1, with an average of 0.50. These values were derived directly from the Z-scores, using a cumulative standard normal distribution. For example, a Z-score of 0 equals a probability of 50 percent or, here, an index score of 0.50, indicating that a state’s value for that indicator is equal to the 50-state average for that year. Conceptually, the result represents the percentile ranking of the Z-scores, and indicates the extent to which the state performed well or poorly relative to the other states included in the calculation of the index.

For example, using the high school diploma attainment rate, the first step in this method is to calculate the mean and standard deviation across all the states for a particular year. In 2009, Kentucky’s high school diploma attainment rate was 87 percent. The mean and standard deviation across all 50 states for that year were 90 percent and 4 percent, respectively. The Z-score was calculated as  $(0.90-0.87)/0.04$ . The probability value for this Z-score value is 0.15. The education index score was then obtained by calculating the average of this score and the other ten education indicators.

TABLE 3 Comparing Education Indicators for Kentucky and the Average of the Top 10 States, 2009		
Education Indicators	Kentucky	Average for Top 10 States
HS Diploma or Higher	87%	93%
Two-Year Degree or Higher	34%	48%
Bachelor’s Degree or Higher	24%	37%
9th-12th Grade Dropout Rates	3.0%	2.9%
ACT State Composite Scores	19.4	22.5
8th Grade Math NAEP	27%	43%
8th Grade Reading NAEP	33%	38%
8th Grade Science NAEP	31%	38%
4th Grade Math NAEP	37%	49%
4th Grade Reading NAEP	36%	39%
4th Grade Science NAEP	36%	36%

Note: The top 10 states based on the education index are MA, NH, MN, VT, CT, NJ, ND, MT, VA, and WI.

<sup>1</sup> Kentucky’s ACT score dropped in 2009 when all students (100%) began taking the test, compared to 72% in 2008. Nationally, 45% of students took the ACT in 2009 and 43% in 2008.

<sup>2</sup> The complex data requirements for determining an accurate high school dropout rate is something all states confront, including Kentucky. The Kentucky Auditor of Public Accounts issued a report in October 2006, for example, in which it delineated problems with how Kentucky determines its dropout rate (*Kentucky’s Dropout Rate: October 2006—Performance Audit*, available at <[http://www.auditor.ky.gov/Public/Audit\\_Reports/Archive/2006Dropoutreport.pdf](http://www.auditor.ky.gov/Public/Audit_Reports/Archive/2006Dropoutreport.pdf)>. Indeed, questions about the validity and accuracy of high school graduation and dropout rates have arisen in all 50 states. However, the National Center for Education Statistics (NCES), the source of our dropout data, requires states to adhere to the Common Core of Data (CCD) dropout definition and reporting procedures. Since all states face similar problems in determining an accurate dropout rate and all states adopt a uniform reporting method for the CCD, we believe it is useful and instructive to compare the *relative* positions of states with respect to their dropout rates. It is analogous to a race with 50 individuals that is timed with a faulty stopwatch. If the second hand moves too fast, the *absolute* finish times will be incorrect—but their *relative* finish times, which are what we capture in the index, will be illustrative of how fast one runs relative to the group.

<sup>3</sup> Amy Watts, *Kentucky Ranks 35th on Education Index*, Policy Note No. 27, April 2009 (Frankfort, KY: Kentucky Long-Term Policy Research Center) <[http://www.kltprc.net/policynotes/pn0027\\_education\\_index.pdf](http://www.kltprc.net/policynotes/pn0027_education_index.pdf)>.

<sup>4</sup> Refer to the technical appendix for detailed information on the data sources. Available at <[http://www.kltprc.net/policy notes/pn0034\\_appendix.pdf](http://www.kltprc.net/policy notes/pn0034_appendix.pdf)>.