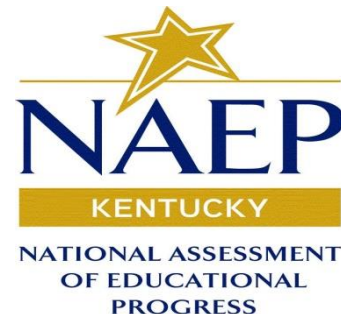


NAEP 2011

Mathematics

Mark DeCandia
Kentucky NAEP State Coordinator
Mark.DeCandia@education.ky.gov





The
Nation's
Report Card

ies NATIONAL CENTER FOR
EDUCATION STATISTICS
Institute of Education Sciences

Reading and Mathematics 2011

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS AT GRADES 4 AND 8

Mark DeCandia
Kentucky NAEP State Coordinator
Mark.DeCandia@education.ky.gov



What is NAEP?

- The National Assessment of Educational Progress (NAEP) is the largest continuing and nationally representative assessment of what our nation's students know and can do in core subjects.
- A survey designed to produce national, state, and select urban district level results.
 - NAEP results are for populations of students, not for individual students nor schools.
 - Measures student performance nationally and reports changes over time.
 - Allows comparisons between states and the nation.

NAEP School and Student Selection

- NAEP uses a carefully designed sampling procedure for the assessment to be representative of the geographical, racial, ethnic, and socio-economic diversity of schools and students in the state.
 - First, schools are selected to be representative of schools.
 - Then, within each chosen school students are randomly selected to participate. Each participating student represents hundreds of other similar students.

NAEP Administration

- NAEP is administered over a six-week period.
 - For 2011: January 24th – March 4th
- About 3,000 students in approximately 100 schools are selected in each state for each grade and subject.
 - Each student is only assessed in one subject area.
 - Students only take a small portion of the assessment
 - Accommodations are provided as necessary for students with disabilities and English language learners.

NAEP Results

- The results of NAEP are released as *The Nation's Report Card*.
 - The report card provides national, state, and district-level results, results for different demographic groups, inclusion information, and sample questions.
- NAEP Results are reported in two formats
 - Average Scale Scores
 - Numeric scale
 - 0 – 500 on mathematics and reading assessments
 - Scores cannot be compared across content areas
 - Achievement Levels
 - Categorical scale
 - Below *Basic*, *Basic*, *Proficient*, *Advanced*

Student, School/District Characteristics for Kentucky Public Schools



Student Characteristics	Racial/Ethnic Background	School/District Characteristics
Number enrolled: 670,030	White: 84.7%	Number of school districts: 174*
Percent in Title I schools: 80.9%	Black: 11.0%	Number of schools: 1,560
With Individualized Education Programs (IEP): 16.1%	Hispanic: 3.0%	Number of charter schools: N/A
Percent in limited-English proficiency programs: 2.2%	Asian/Pacific Islander: 1.1%	Per-pupil expenditures: \$8,522
Percent eligible for free/reduced lunch: 51.6%	American Indian/Alaskan Native: 0.1%	Pupil/teacher ratio: 15.4
		Number of FTE teachers: 43,451

2011 NAEP Participation School and Student Counts



Total number of schools that participated:

- Grade 4 - 185
 - Grade 8 - 131
- 316

Total number of students assessed:

- Grade 4 – 4,800
 - Grade 8 – 3,900
- 8,700

2011 Kentucky Participation in NAEP




- Total Kentucky NAEP Districts – **123**
 - 4th Grade – **185 (State NAEP)**
 - 8th Grade – **131 (State NAEP)**
 - 12th Grade – 11 (National only)
- 327 Total Schools with 12th**
-
- *TUDA (Jefferson County) -107 Schools*



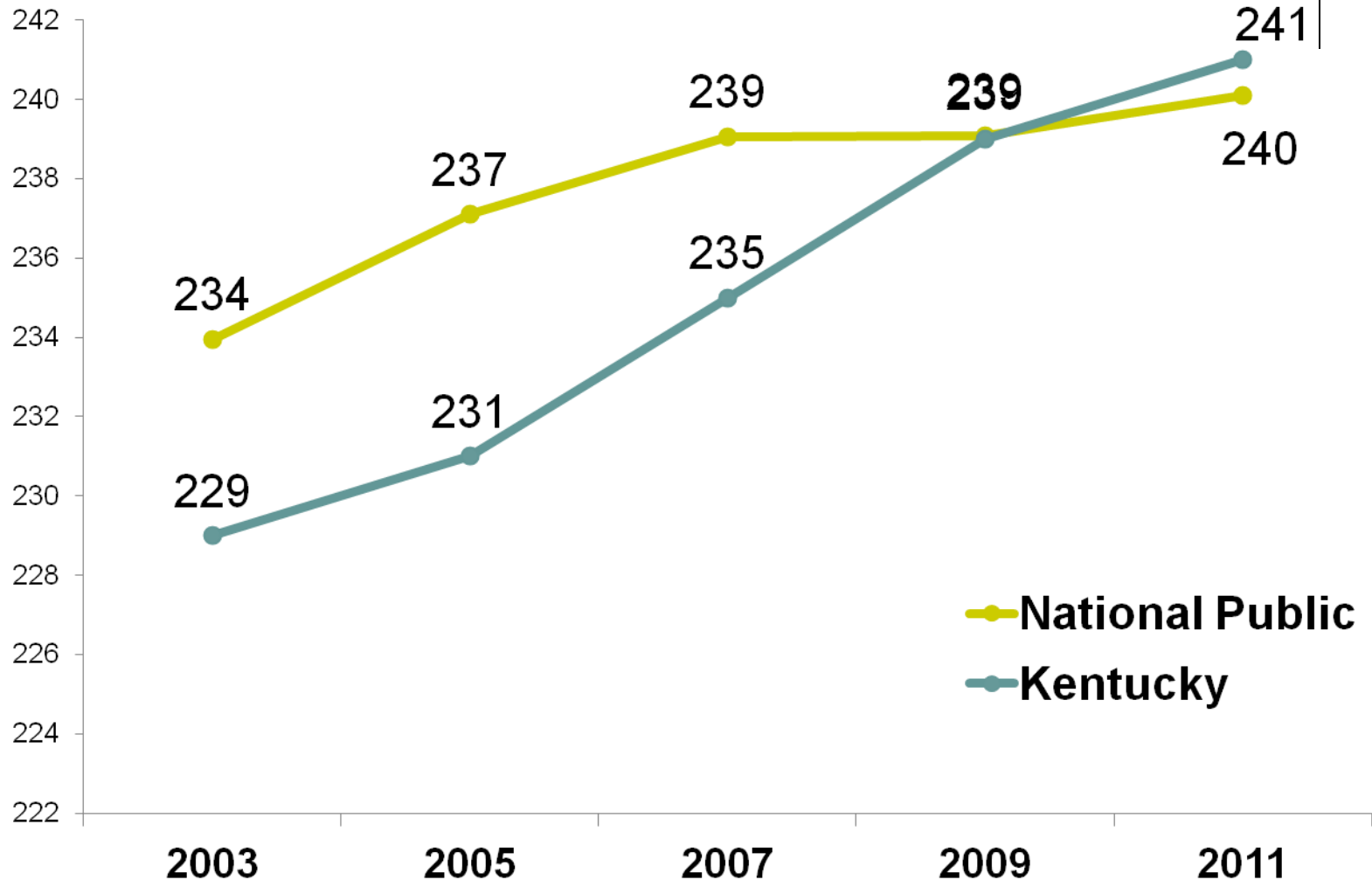
Mathematics

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS AT GRADES 4 AND 8



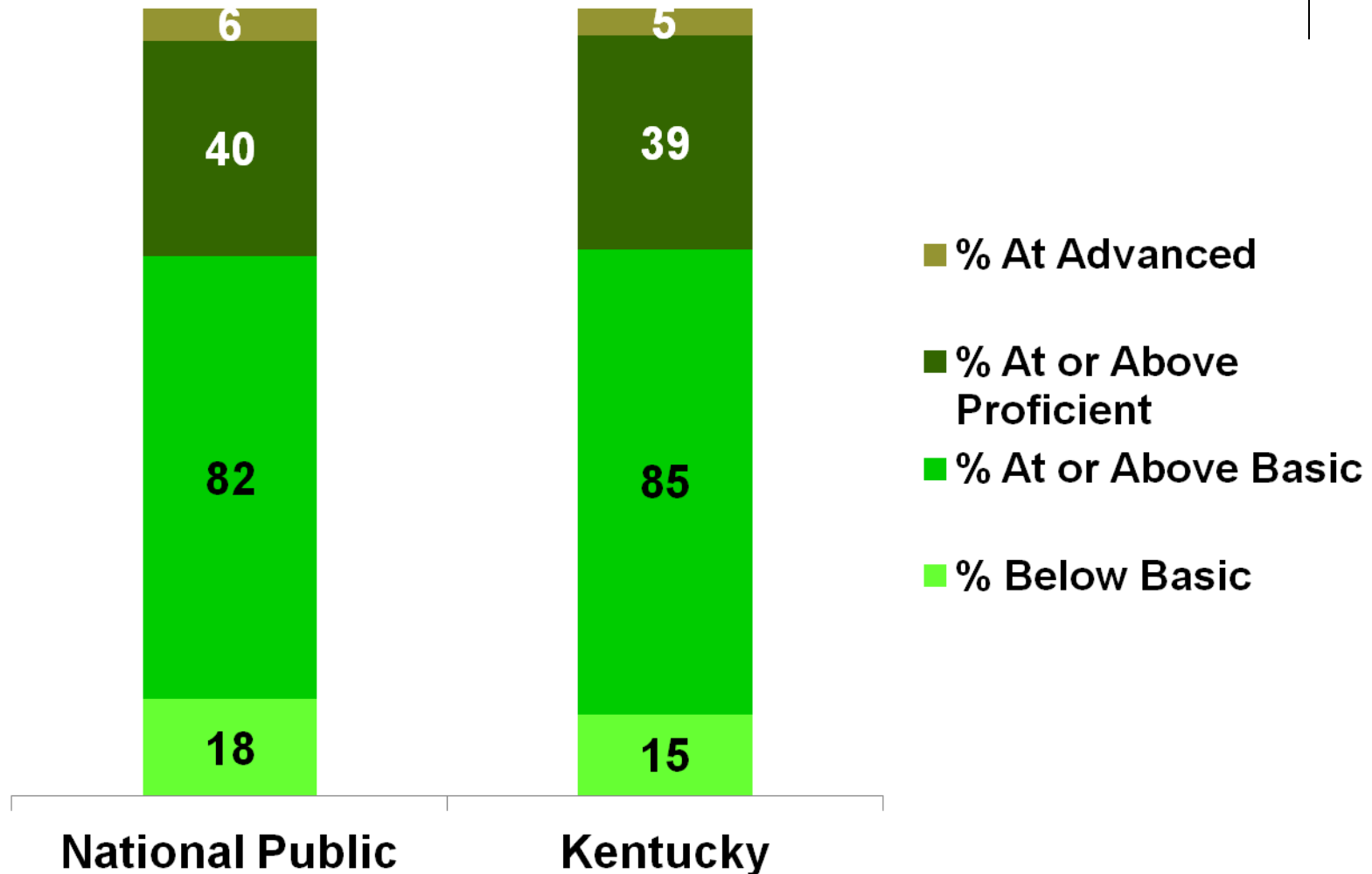
Grade 4 Mathematics Results

Math 4th Grade Average Scale Scores Over Time



NOTE: Observed differences are not necessarily statistically significant.

Math 4th Grade 2011 Achievement Levels



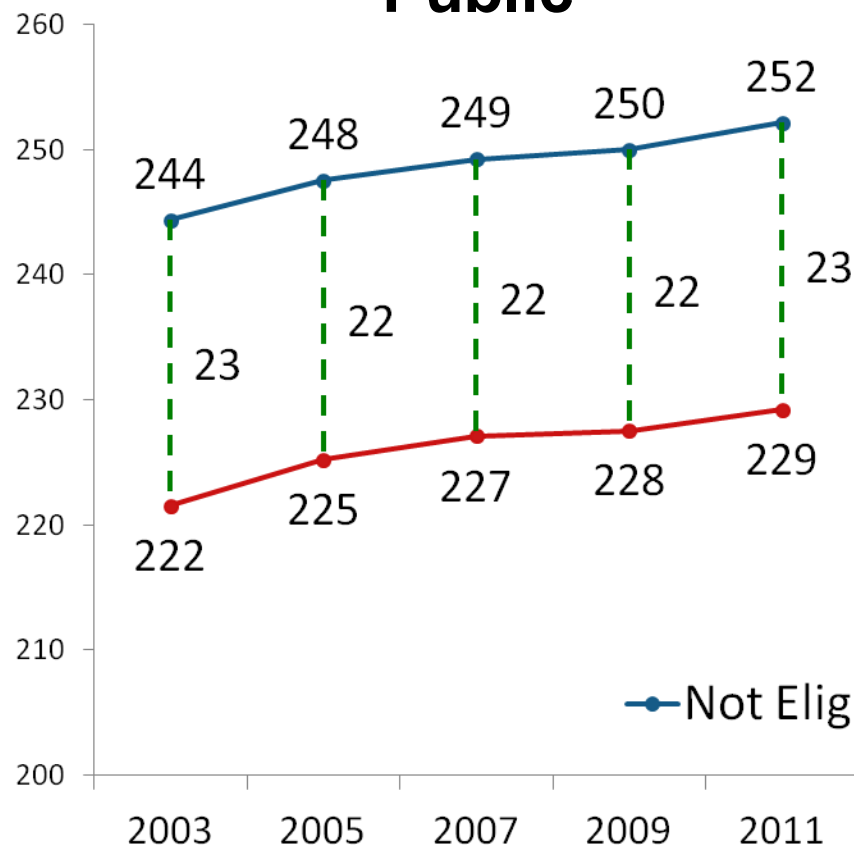
NOTE: Observed differences are not necessarily statistically significant. Percentages might not sum to 100 due to rounding.

Math 4th Grade

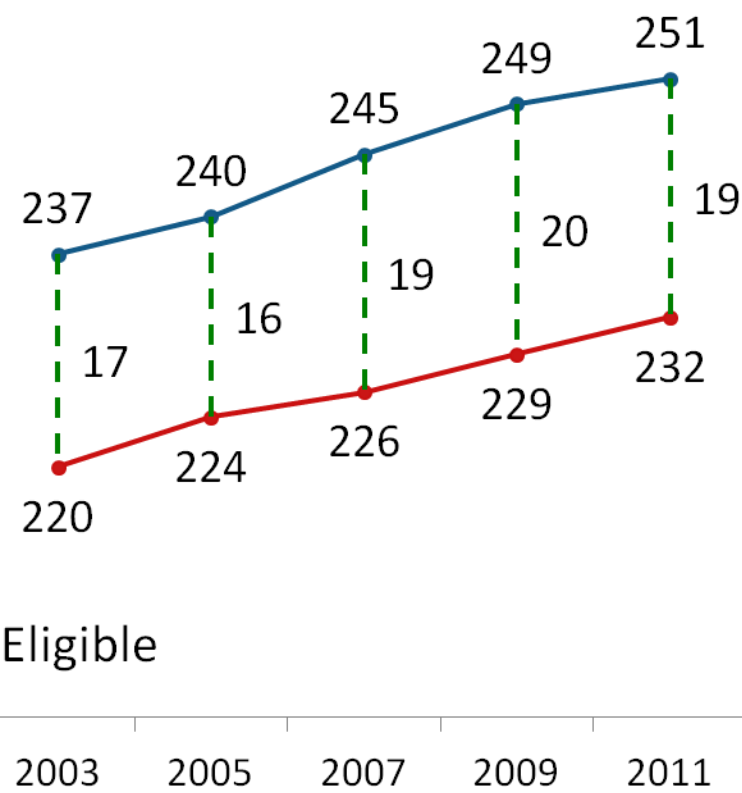
Score Gap Comparison:

NSLP Not Eligible and Eligible

National Public



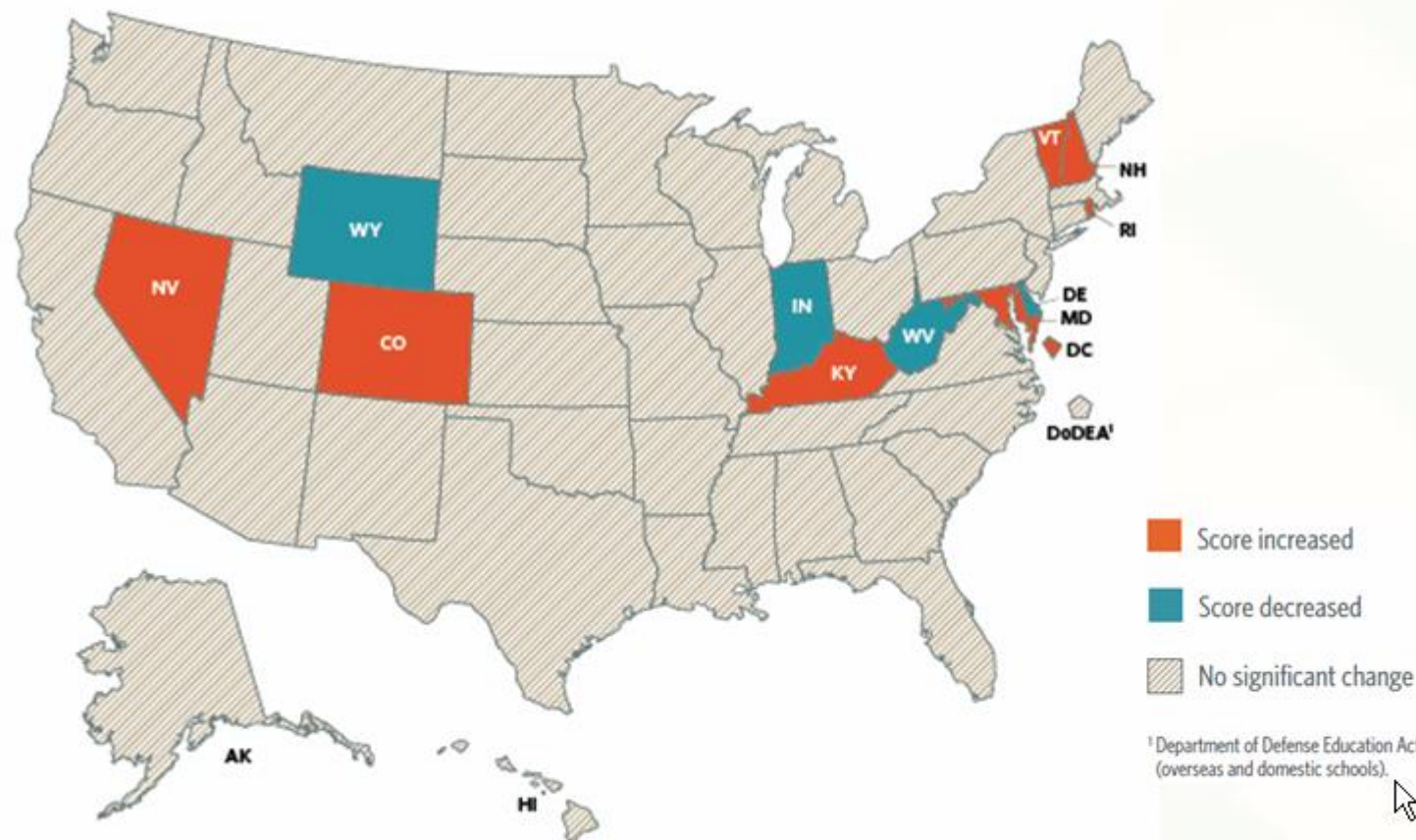
Kentucky



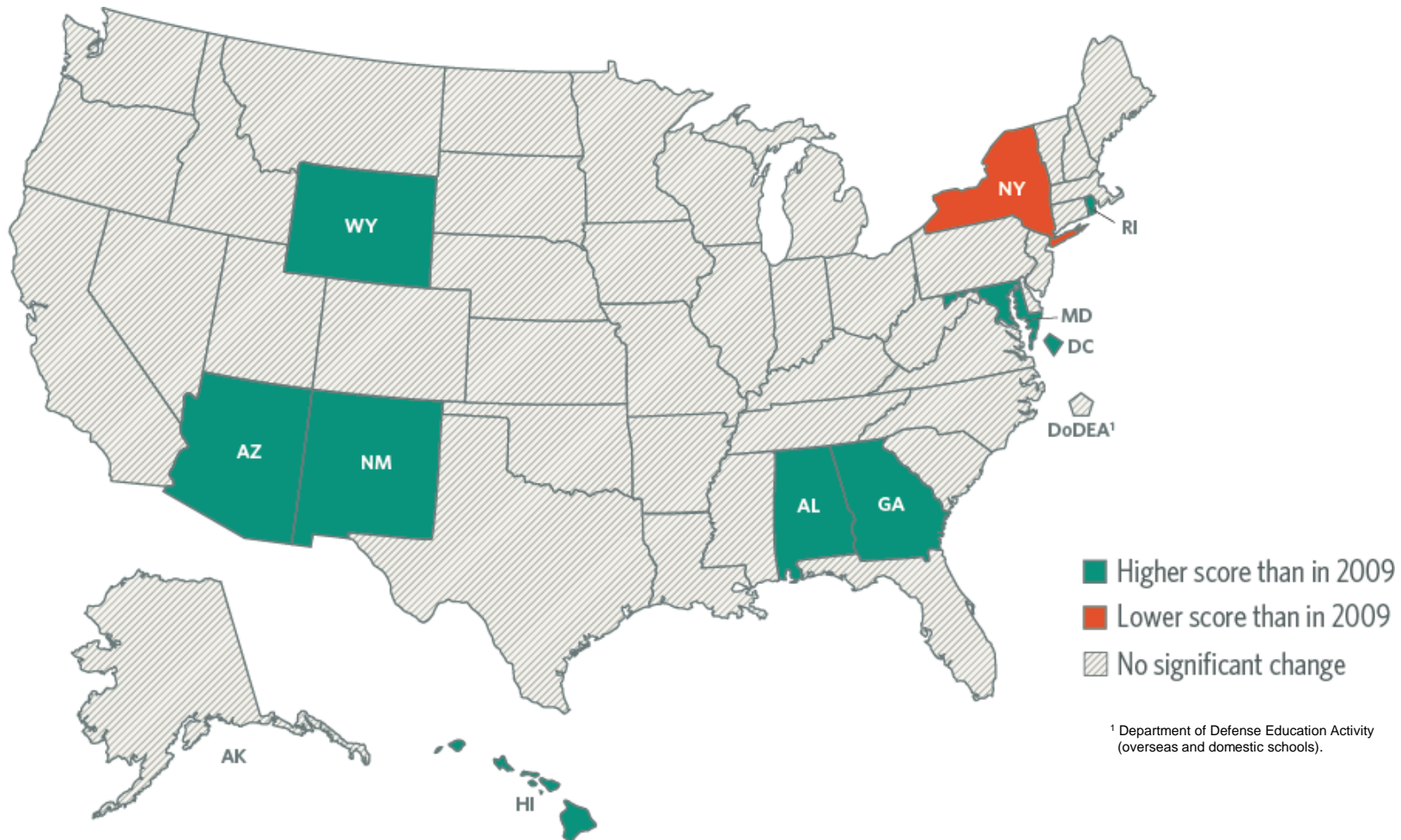
NOTE: Observed differences are not necessarily statistically significant.

Changes in State Scores Between 2007 and 2009

- Scores increase since 2007 in 8 states and decrease in 4 states



During 2011 - 4th Grade Math Students in 9 states/jurisdictions score higher than in 2009, and students in 1 state score lower

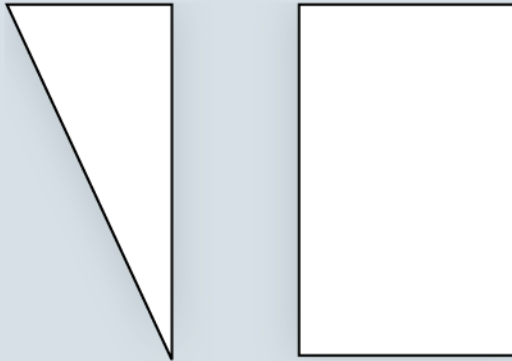


Proportions of questions vary by grade in five mathematical content areas

	Grade 4	Grade 8
Number properties and operations	40%	20%
Measurement	20%	15%
Geometry	15%	20%
Data analysis, statistics, and probability	10%	15%
Algebra	15%	30%

Geometry Question

Nationwide 49% of fourth-graders were able to identify a property common to two geometric shapes



How are the right triangle and the rectangle alike?

- ☐ A Each figure has at least one right angle.
- ☐ B Each figure has parallel sides.
- ☐ C Each figure has at least one line of symmetry.
- ☐ D Each figure has at least two sides that are the same length.

Percentage of fourth-grade students in each response category: 2011

Choice A	Choice B	Choice C	Choice D	Omitted
49	9	12	29	1

Eligibility
for free/
reduced-price
school lunch

Yes	41
No	58

2011 NAEP Math Scale Scores

	Kentucky	Nation
4 th Grade Mathematics Scale Score	241	240
8 th Grade Mathematics Scale Score	282	283

2011 KY MATH Grade 4

Compared w/ Other Jurisdictions

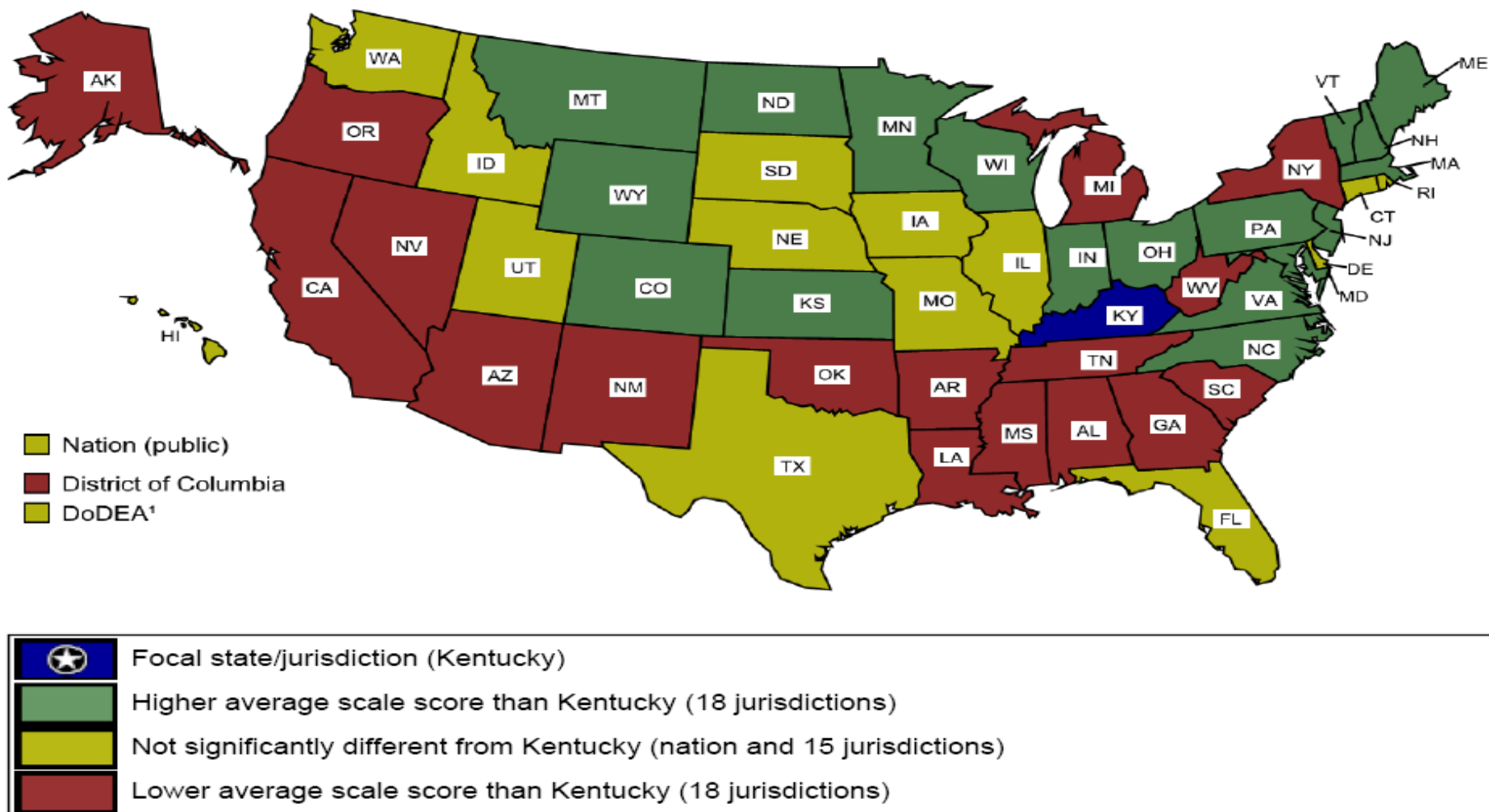


Students' average scale scores:

- Higher than KY (18 Jurisdictions)
- Not significantly different (nation and 15 Jurisdictions)
- Lower than KY (nation and 18 Jurisdictions)

Math Grade 4 – 2011

Difference in Average scale scores Between Jurisdictions for All students



¹ Department of Defense Education Activity (overseas and domestic schools).

NOTE: Significance tests used a multiple-comparison procedure based on all jurisdictions that participated.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Mathematics Assessment.

Kentucky Average Scale Scores for Grade 4 **Math** 2000 to 2011



Year	Average Scale Score
2000	221
2003	229
2005	231
2007	235
2009	239
2011	241

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000, 2003, 2005 and 2007 Mathematics Assessments.

Kentucky Average Scale Scores for Grade 4 **Math** 2000 to 2011

	Kentucky – 4 th Grade Scale Score Average	Nation – 4 th Grade Scale Score Average
2000	221	226
2003	229	234
2005	231	237
2007	235	239
2009	239	239
2011	241	240

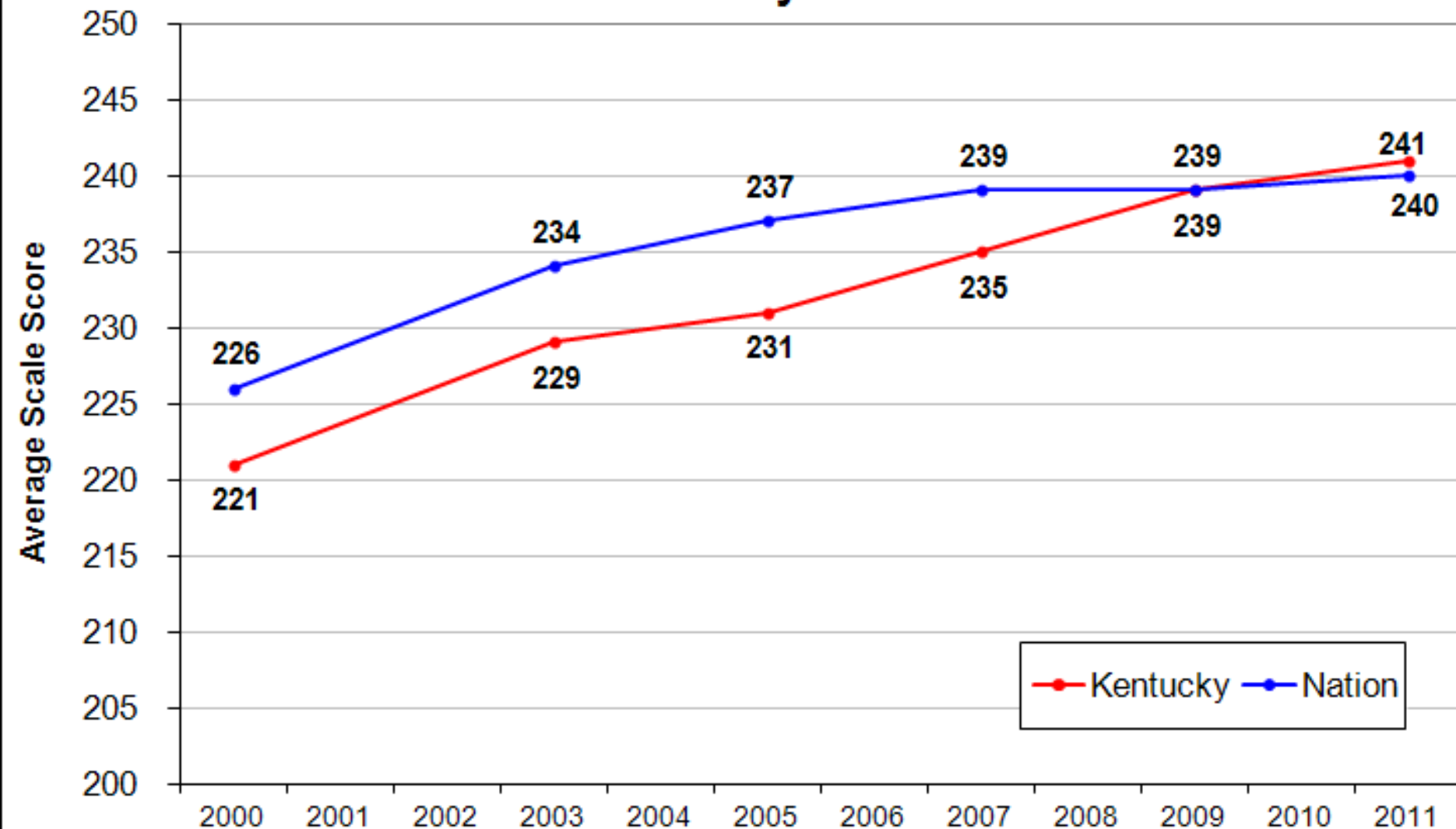
KY Average Scale Scores: Grade 4 Math 2000 - 2011



	Kentucky 4 th Grade Scale Score Average	Nation 4 th Grade Scale Score Average	KY TUDA Average (Jefferson County Public Schools)	TUDA Average (Large Cities)
2000	221	226		
2003	229	234		
2005	231	237		
2007	235	239		
2009	239	239	233	231
2011	241	240		

2000-2011 Math Grade 4

Math 4th Grade Kentucky vs Nation 2000-2011



2011 Kentucky Math Grade 4 Scale Score



- ☐ In 2011, the average scale score for students in Kentucky was 241. This was not significantly different from that of students across the nation (240).
- ☐ In Kentucky, the average scale score for students in 2011 was not significantly different from that in 2009 (239). However, the average scale score for student in public schools across the nation in 2011 was higher than that in 2009 (239).

2011 Kentucky Math Grade 4 Achievement Levels

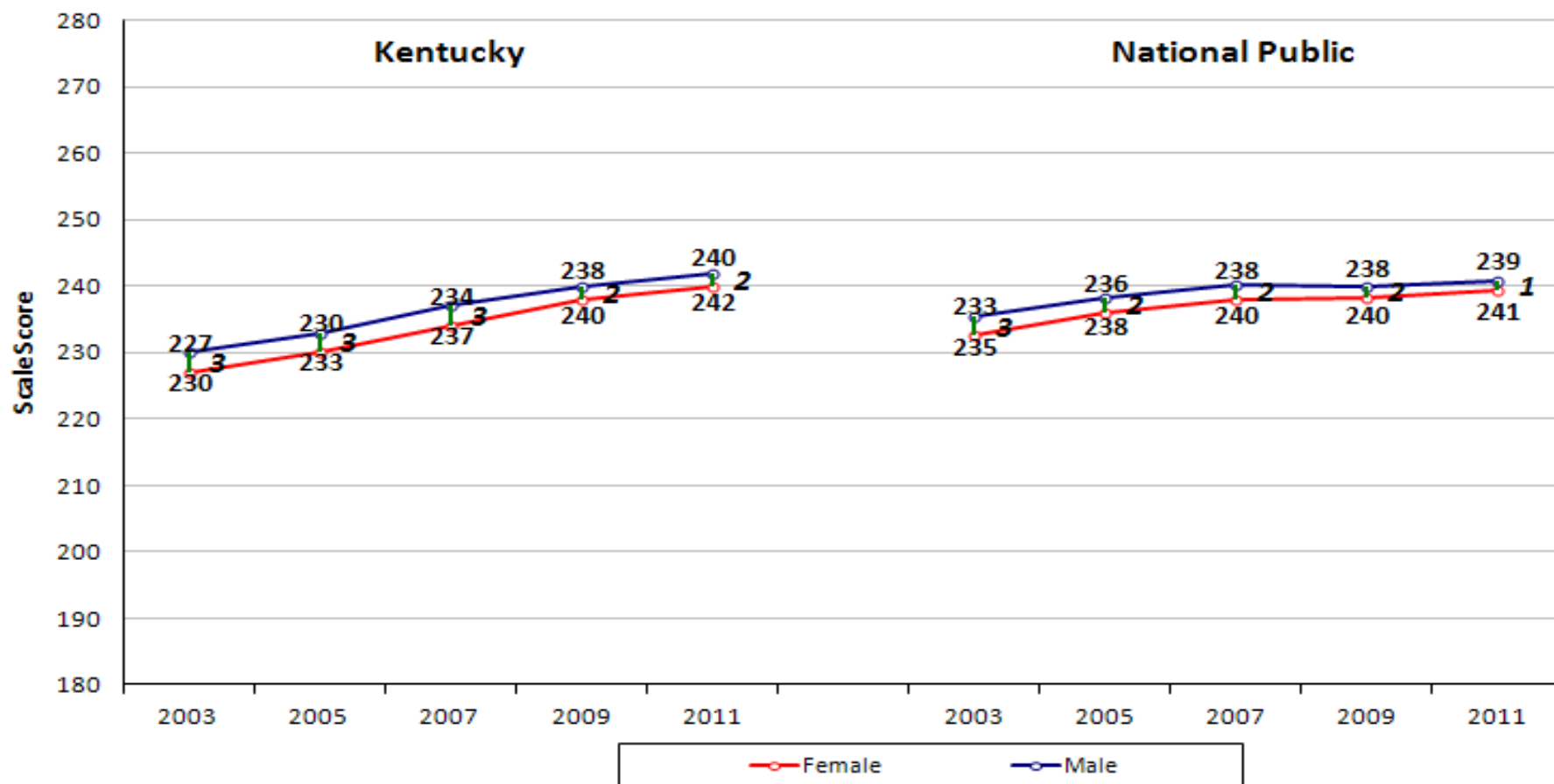


- ☐ In 2011, the percentage of Kentucky's students who performed at or above Proficient was 39 percent. This was not significantly different from the percentage of the nation's public school students who performed at or above Proficient (40 percent).
- ☐ In Kentucky, the percentage of students who performed at or above Proficient in 2011 was greater than the percentages in 1992, 1996, 2000, 2003, 2005, and 2007, but was not significantly different from the percentage in 2009.

Math Grade 4 – 2011

Gender Gap

NAEP Mathematics Grade 4 — Gender
Gap - Average Scale Score: 2003-2011



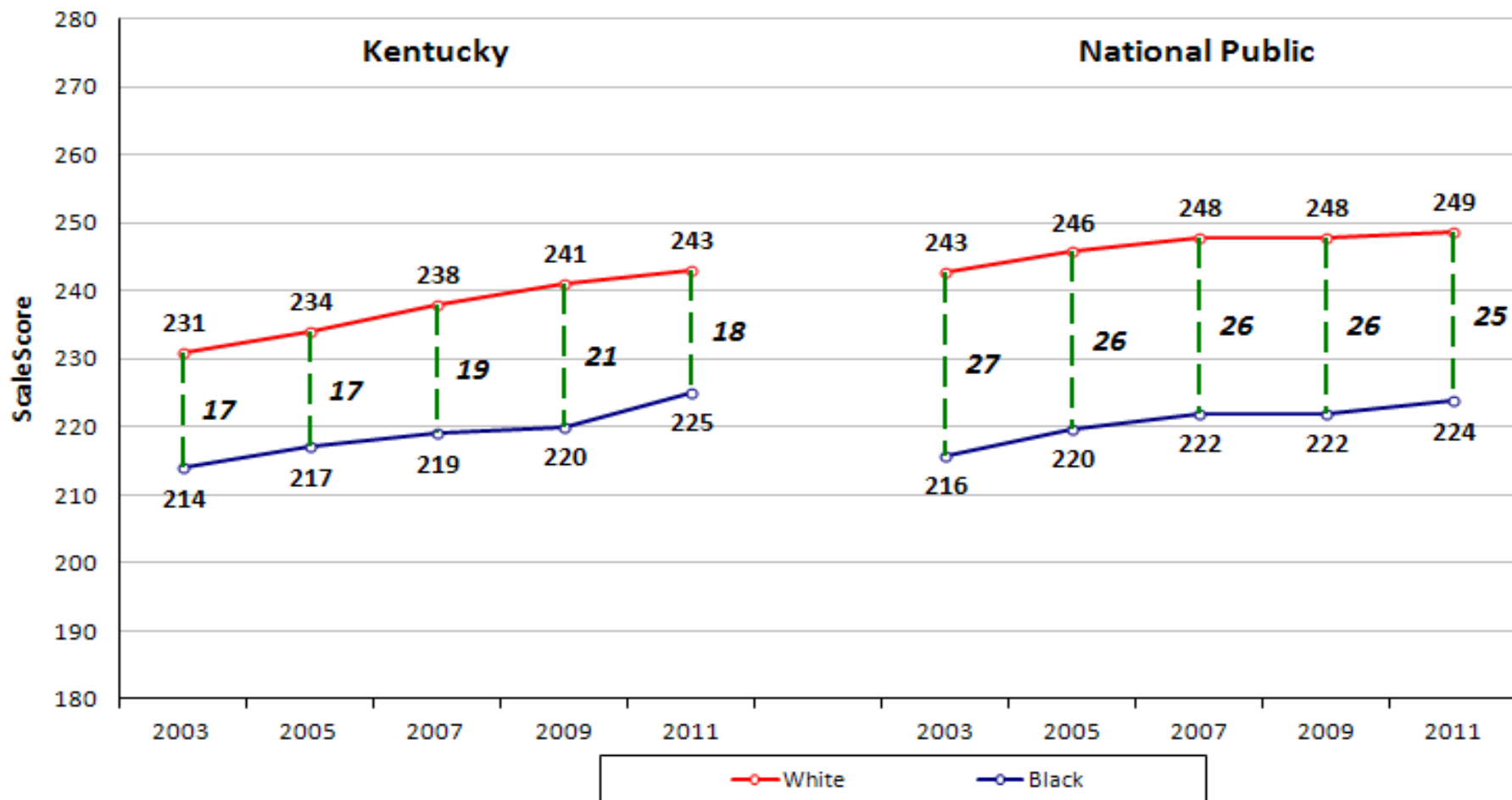
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

Math Grade 4 – 2011

White-Black Gap

NAEP Mathematics Grade 4 — White - Black
Gap - Average Scale Score: 2003-2011



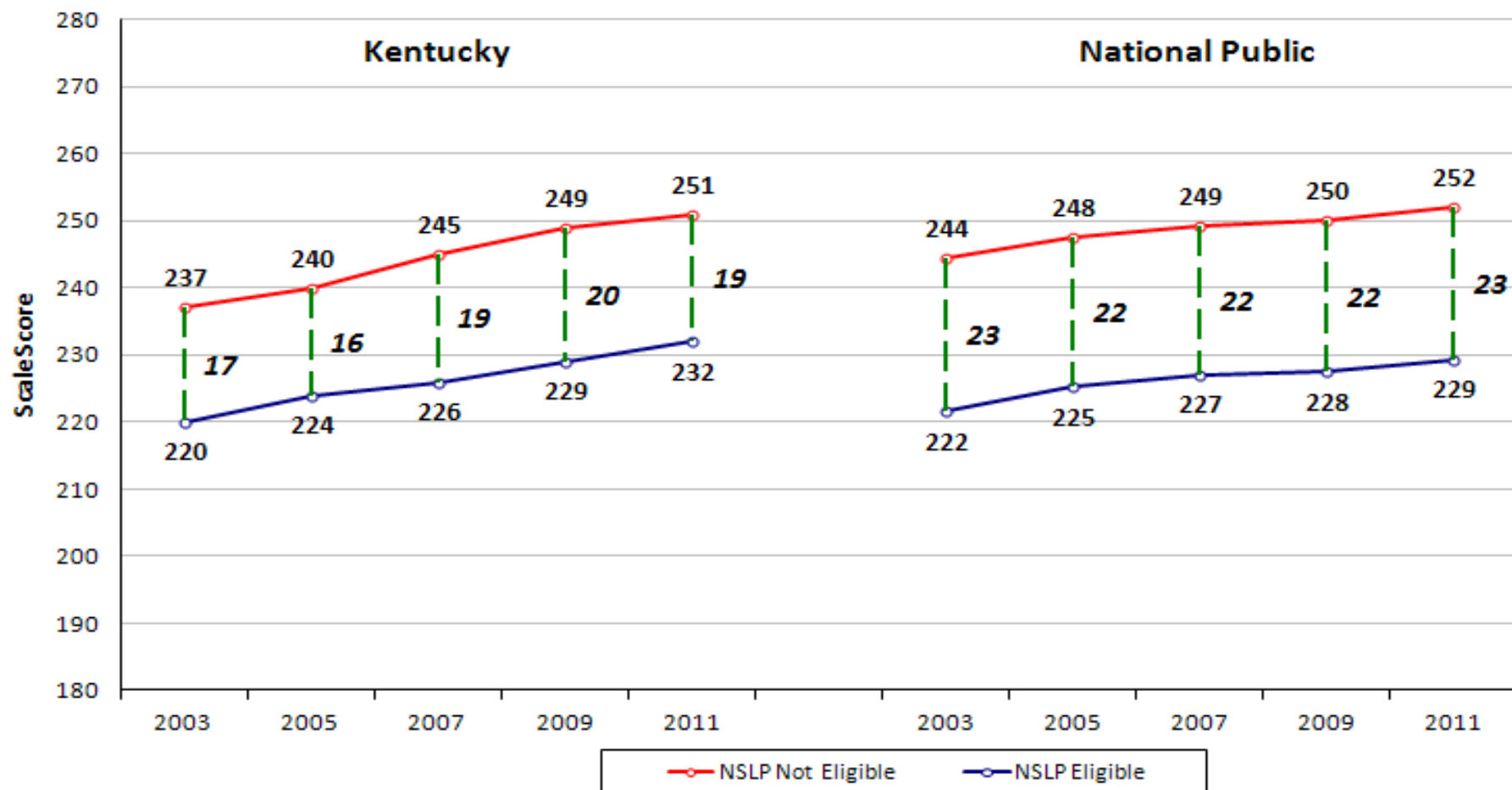
NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

2011 NSLP Not Eligible and Eligible GAP: Math Grade 4

NAEP Mathematics Grade 4 — National School Lunch Program

Gap - Average Scale Score: 2003-2011



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

2007 – 2011 Exclusion Rates of SD and/or ELL – Math Grade 4




	Kentucky's Exclusion Rate			Nation's Exclusion Rate		
	2007	2009	2011	2007	2009	2011
Percentage	3*	3*	3	3*	2*	2

In 2011, **39** states and jurisdictions had lower rates of exclusion than Kentucky's rate.

In 2011, **6** states had higher rates

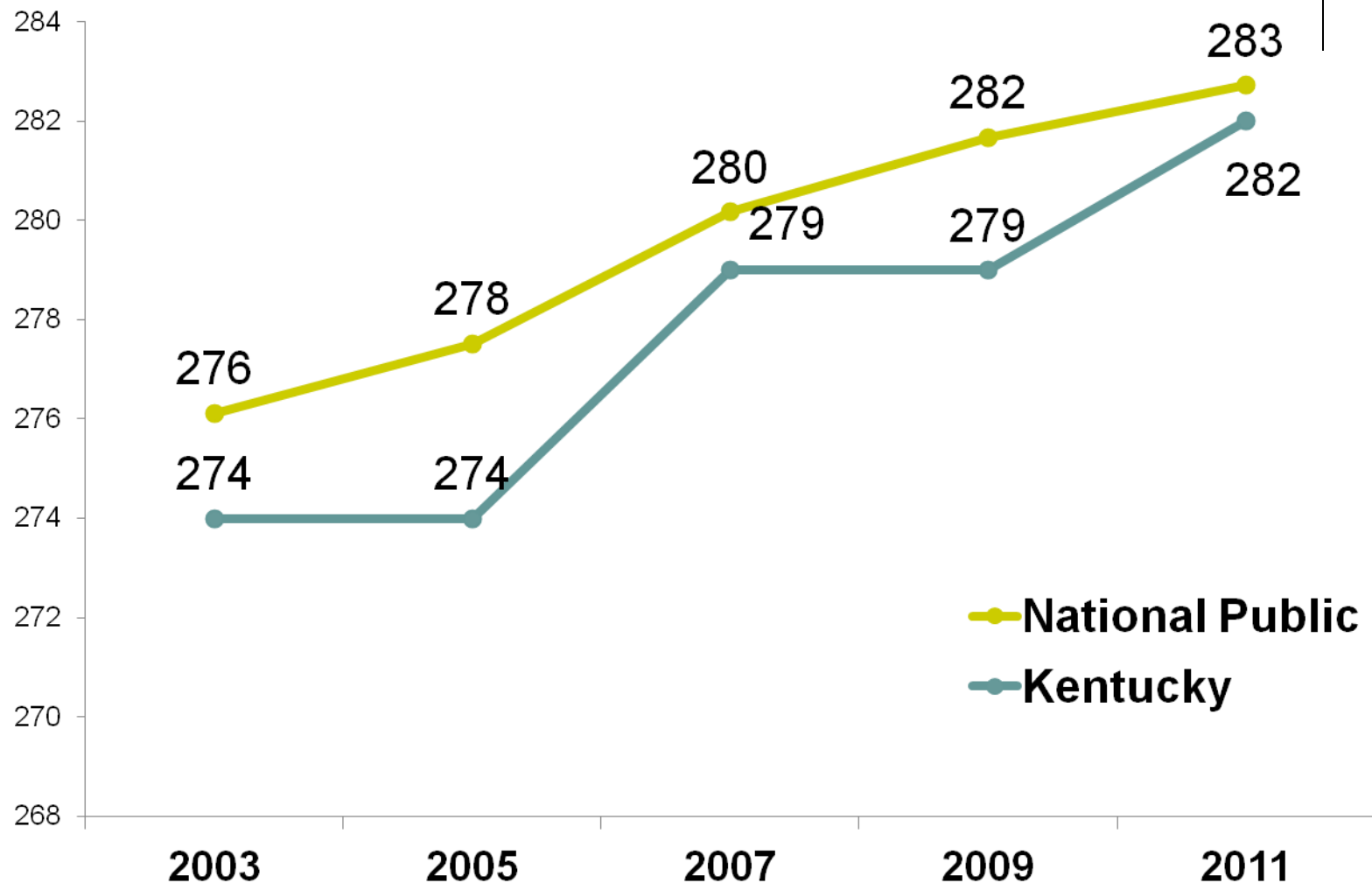
In 2011, **7** states had equal rate

* Rates are rounded to nearest percentage



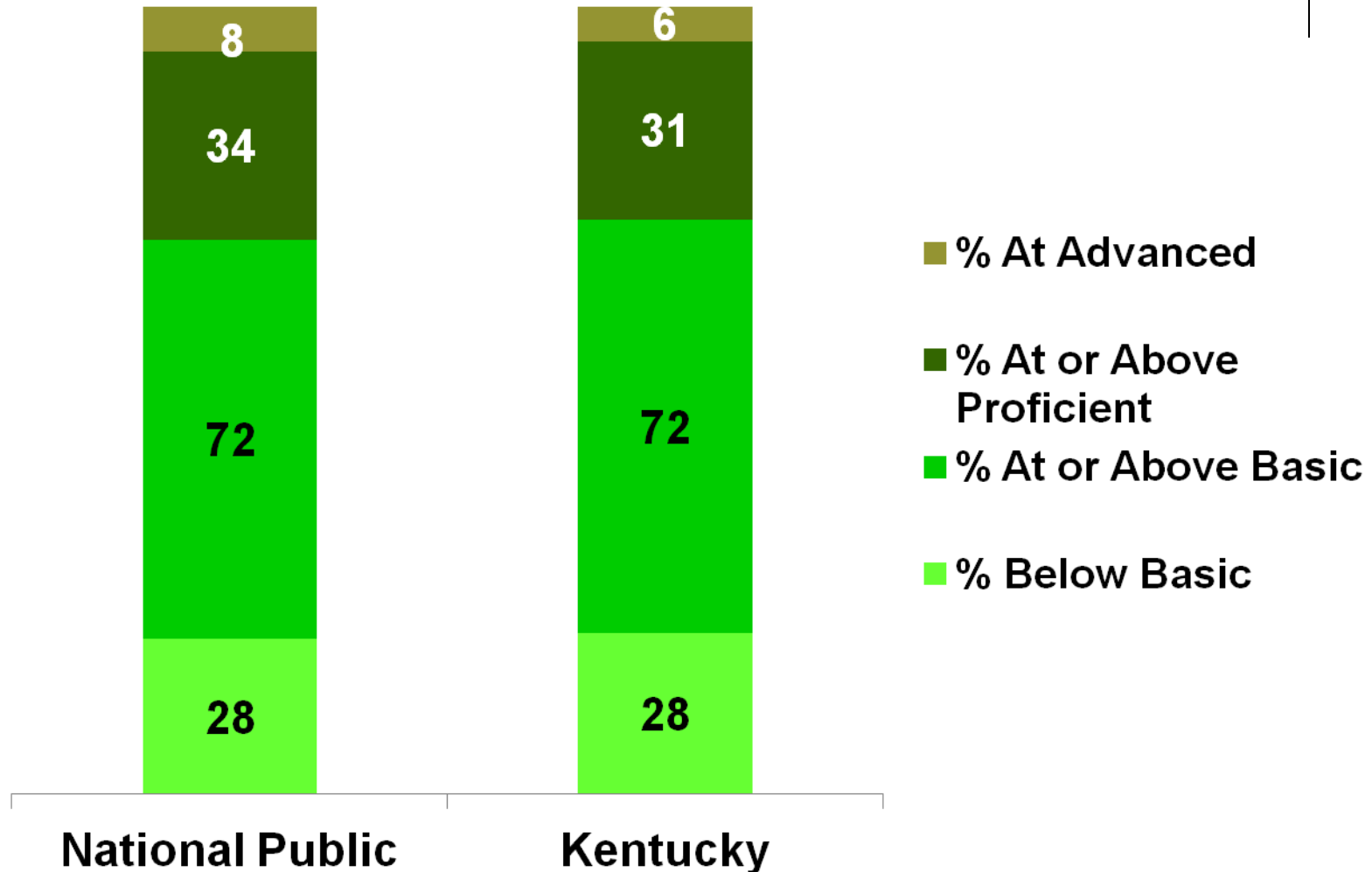
Grade 8 Mathematics Results

Math 8th Grade Average Scale Scores Over Time



NOTE: Observed differences are not necessarily statistically significant.

Math 8th Grade 2011 Achievement Levels



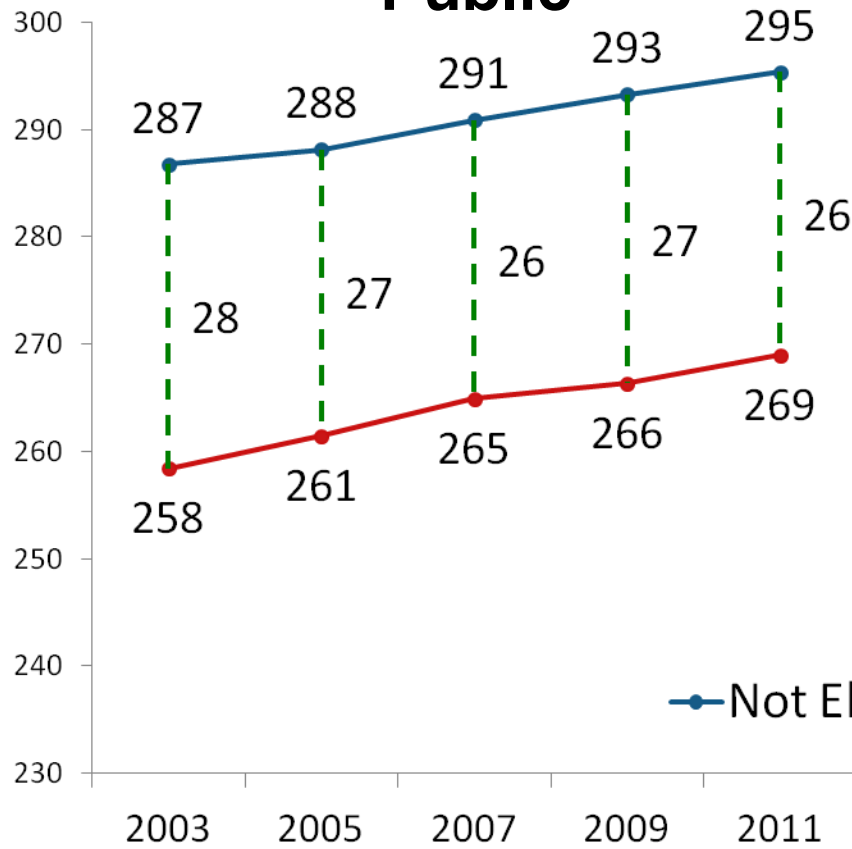
NOTE: Observed differences are not necessarily statistically significant. Percentages might not sum to 100 due to rounding.

Math 8th Grade

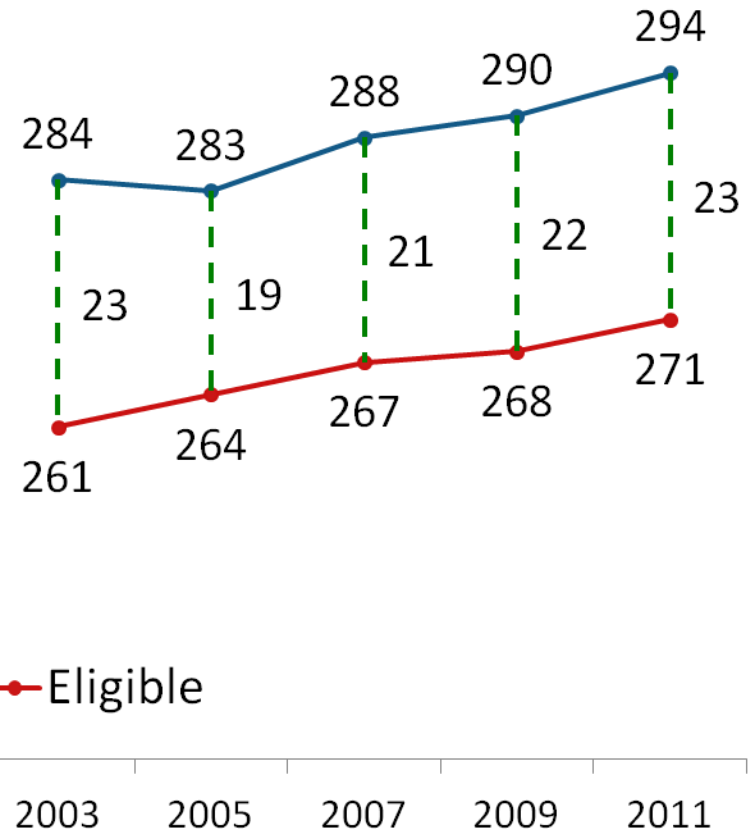
Score Gap Comparison:

NSLP Not Eligible and Eligible

National Public



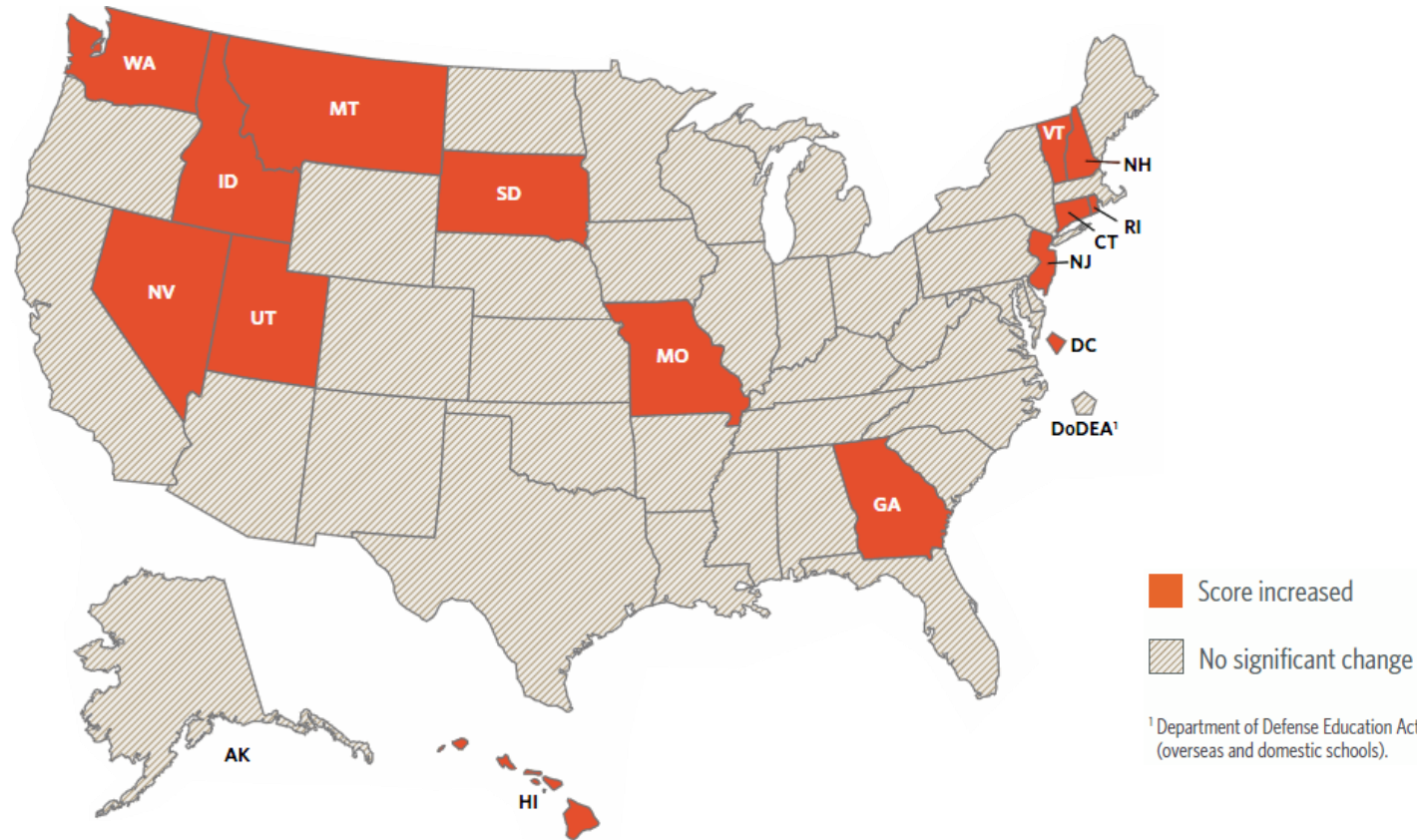
Kentucky



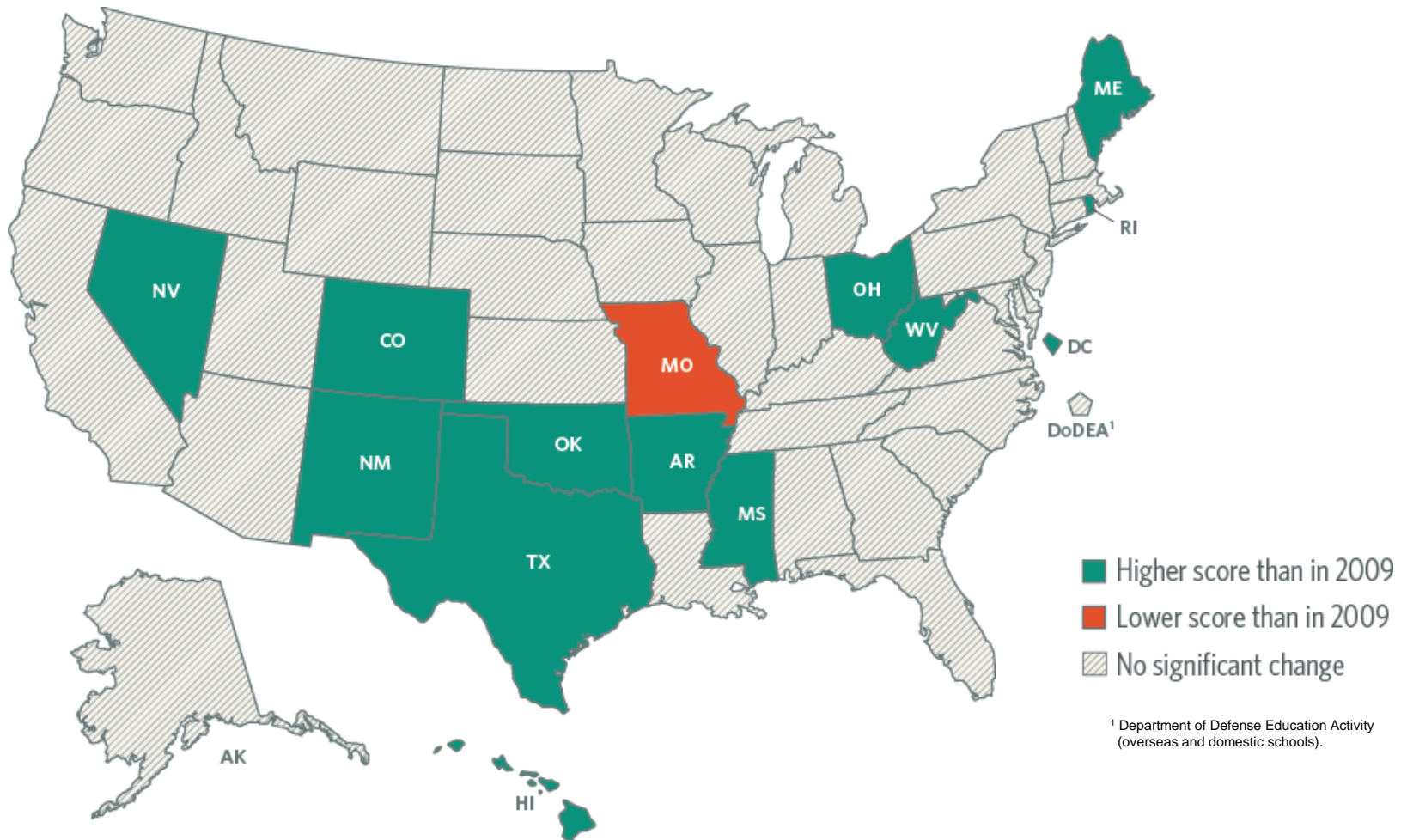
NOTE: Observed differences are not necessarily statistically significant.

During 2009 - Change in State Scores Between 2007 and 2009 for **Grade 8 Math**

- Scores increase since 2007 in 15 states, and no states decline



During 2011 - 8th Math Grade Students in 13 states/jurisdictions score higher than in 2009, and students in 1 state score lower



Algebra Question

31% of eighth-graders were able to identify the equation given a point and the slope

Which of the following is an equation of a line that passes through the point (0, 5) and has a negative slope?

- (A) $y = 5x$
- (B) $y = 5x - 5$
- (C) $y = 5x + 5$
- (D) $y = -5x - 5$
- (E) $y = -5x + 5$

Percentage of eighth-grade students in each response category: 2011

Choice A	Choice B	Choice C	Choice D	Choice E	Omitted
12	27	9	20	31	1

Selected racial/ ethnic groups	
White	34
Black	24
Hispanic	25
Asian	52
American Indian/ Alaska Native	20
Native Hawaiian/ Other Pacific Islander	22

2011 KY MATH Grade 8

Compared w/ Other Jurisdictions

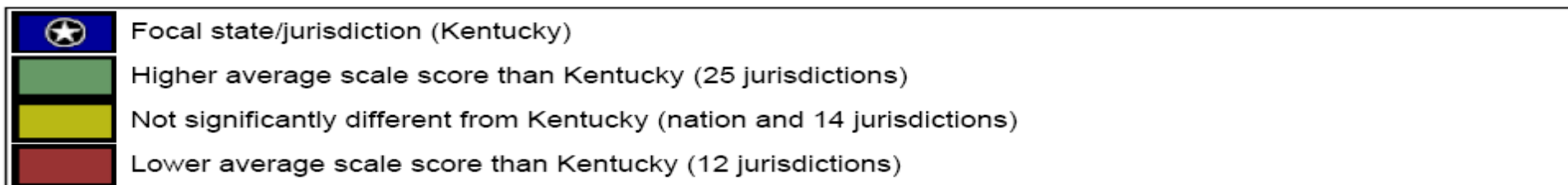
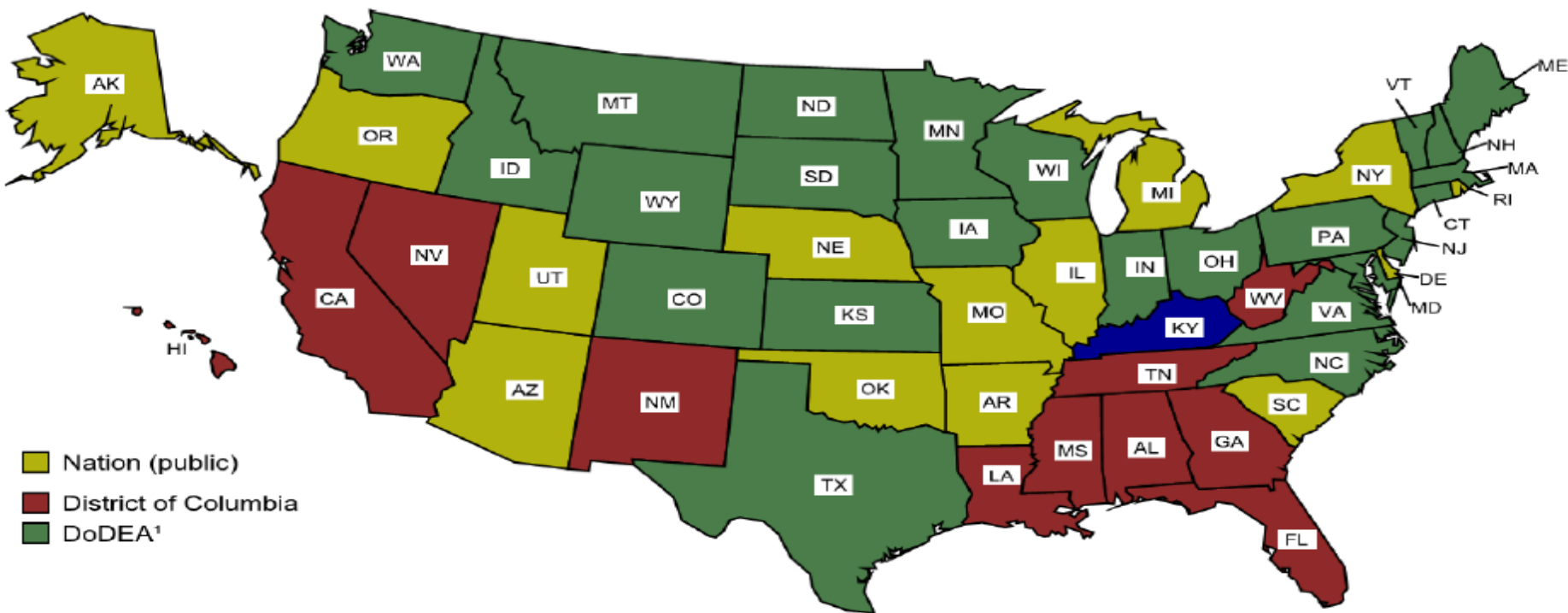


Students' average scale scores:

- Higher than KY (25 Jurisdictions)
- Not significantly different (nation and 14 Jurisdictions)
- Lower than KY (12 Jurisdictions)

Math Grade 8 – 2011 Mathematics, grade 8

Difference in Average scale scores Between Jurisdictions for All students



¹ Department of Defense Education Activity (overseas and domestic schools).

NOTE: Significance tests used a multiple-comparison procedure based on all jurisdictions that participated.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Mathematics Assessment.

Kentucky Average Scale Scores for Math Grade 8 – 2000 to 2011

Year	Average Scale Score
2000	270
2003	274
2005	274
2007	279
2009	279
2011	282

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000, 2003, 2005, 2007, 2009 and 2011 Mathematics Assessments.

Kentucky Average Scale Scores for Math Grade 8 – 2000 to 2011



	Kentucky – 8 th Grade Scale Score Average	Nation – 8 th Grade Scale Score Average
2000	270	272
2003	274	276
2005	274	278
2007	279	280
2009	279	282
2011	282	283

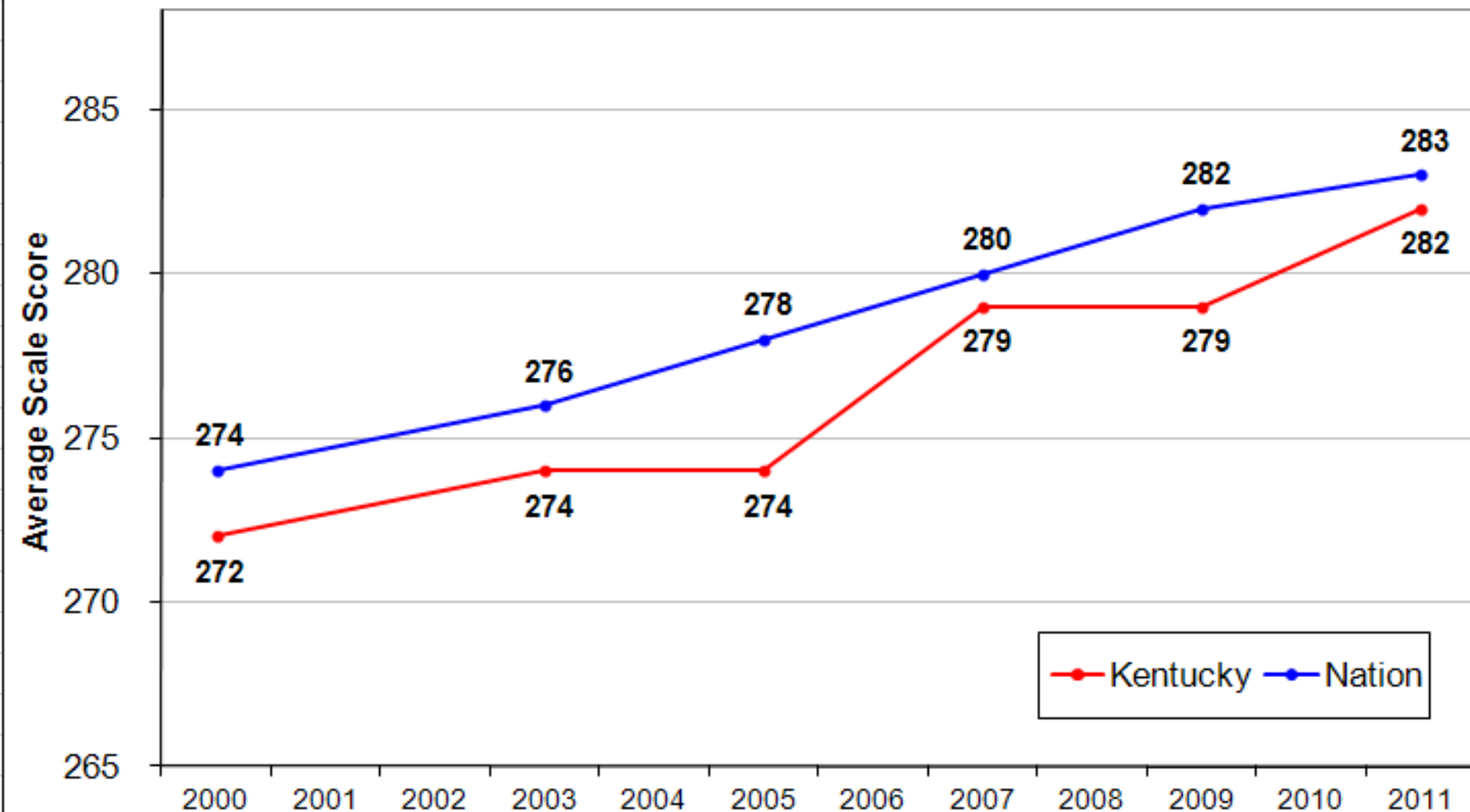
KY Average Scale Scores: Grade 8 Math 2000 - 2011



	Kentucky 8 th Grade Scale Score Average	Nation 8 th Grade Scale Score Average	KY TUDA Average (Jefferson County Public Schools)	TUDA Average (Large Cities)
2000	270	272		
2003	274	276		
2005	274	278		
2007	279	280		
2009	279	282	271	271
2011	282	283		

Math Grade 8

Math 8th Grade Kentucky vs Nation 2000-2011



Kentucky Math Grade 8 – 2011 Scale Score



- ☐ In 2011, the average scale score for students in Kentucky was 282. This was not significantly different from that of students across the nation (283).
- ☐ In Kentucky, the average scale score for students in 2011 was not significantly different from that in 2009 (279). However, the average scale score for student in public schools across the nation in 2011 was higher than that in 2009 (282).

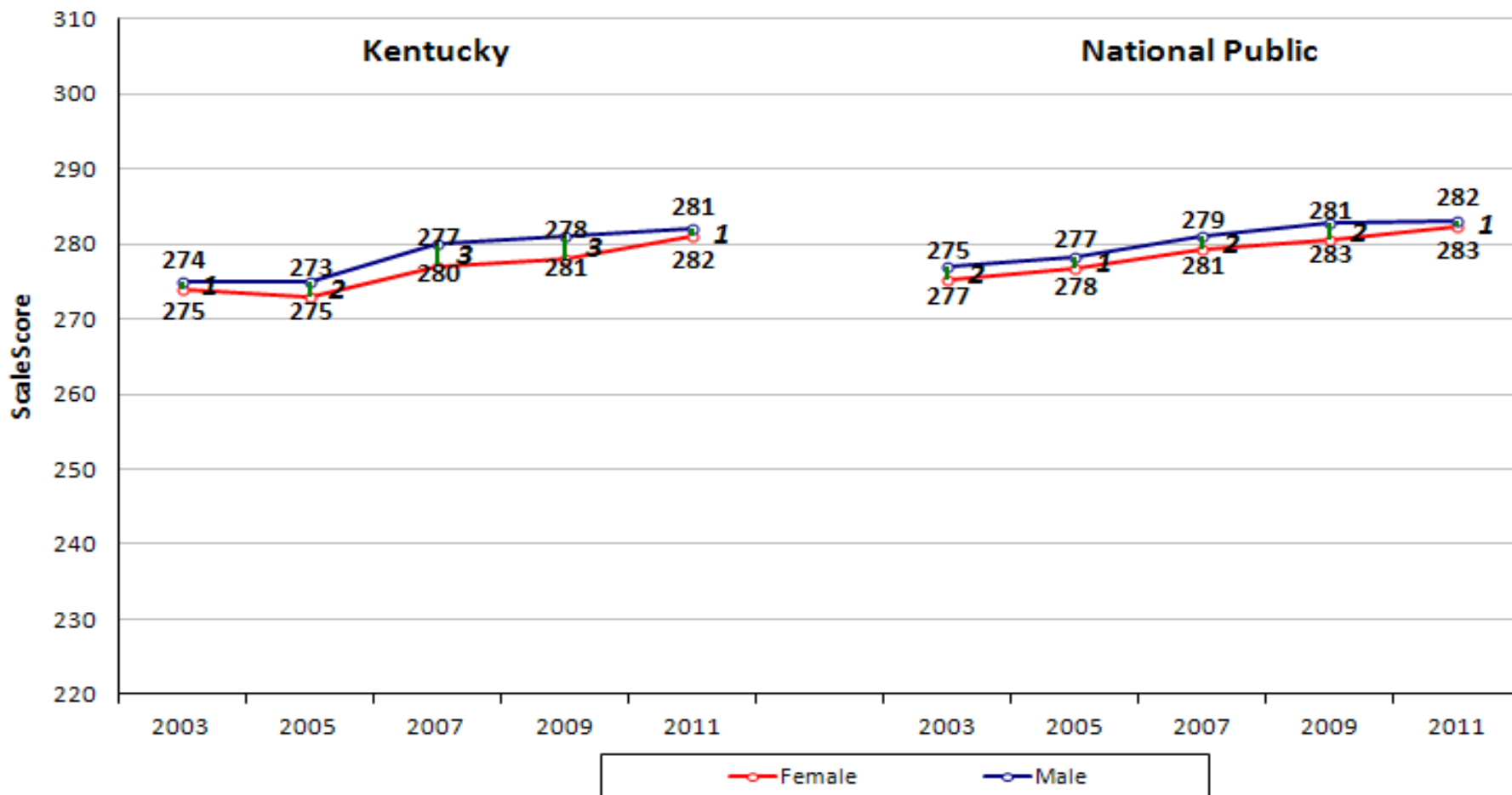
Kentucky Math Grade 8 – 2011 Achievement Levels



- ☐ In 2011, the percentage of Kentucky's students who performed at or above Proficient was 31 percent. This was smaller than the percentage of the nation's public school students who performed at or above Proficient (34 percent).
- ☐ In Kentucky, the percentage of students who performed at or above Proficient in 2011 was greater than the percentages in 1990, 1992, 1996, 2000, 2003, 2005, and 2007, but was not significantly different from the percentage in 2009.

2011 Gender Gap: Math Grade 8

NAEP Mathematics Grade 8 — Gender
Gap - Average Scale Score: 2003-2011



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

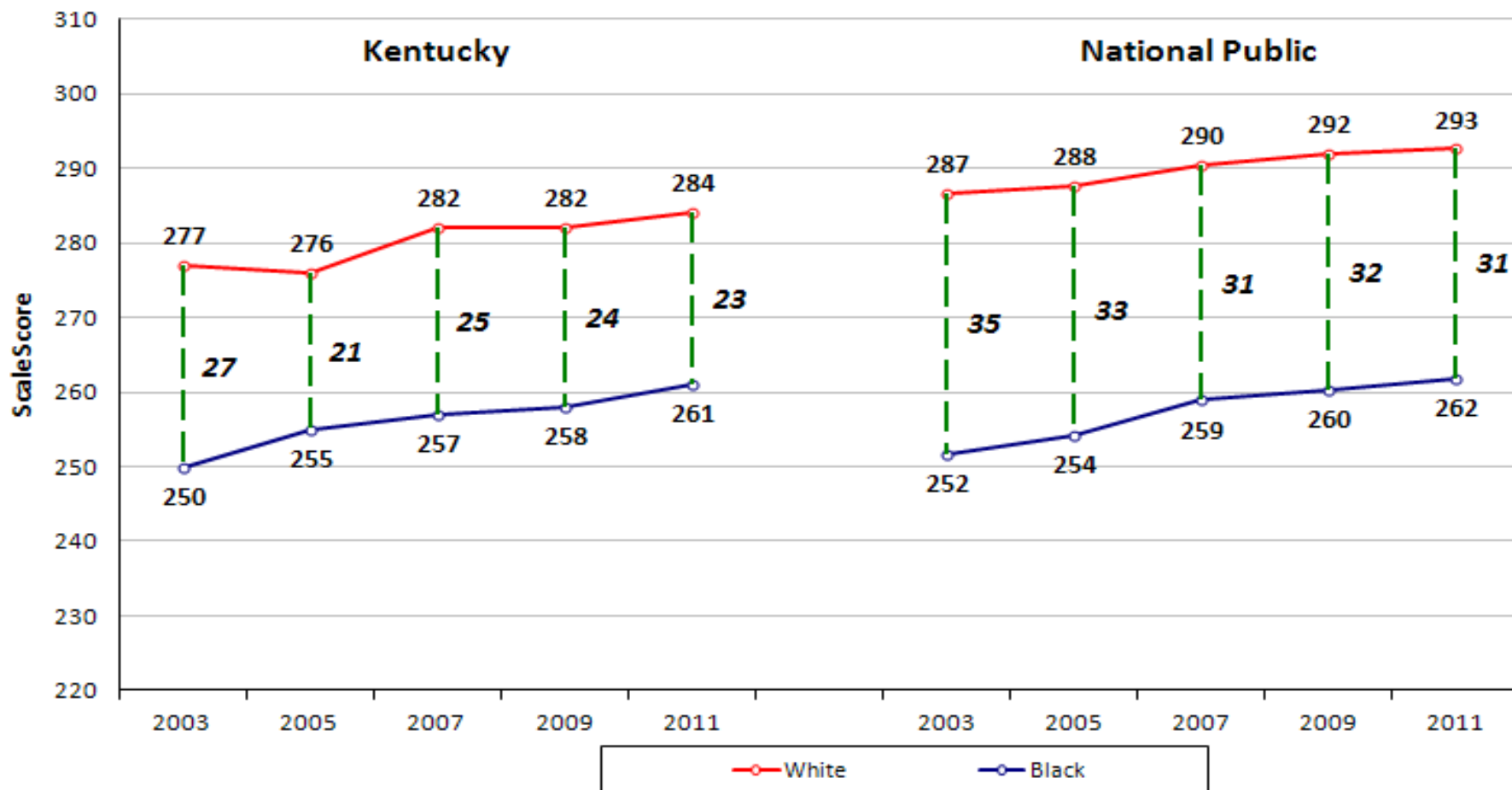
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

Math Grade 8 – 2011

White-Black Gap

NAEP Mathematics Grade 8 — White - Black

Gap - Average Scale Score: 2003-2011

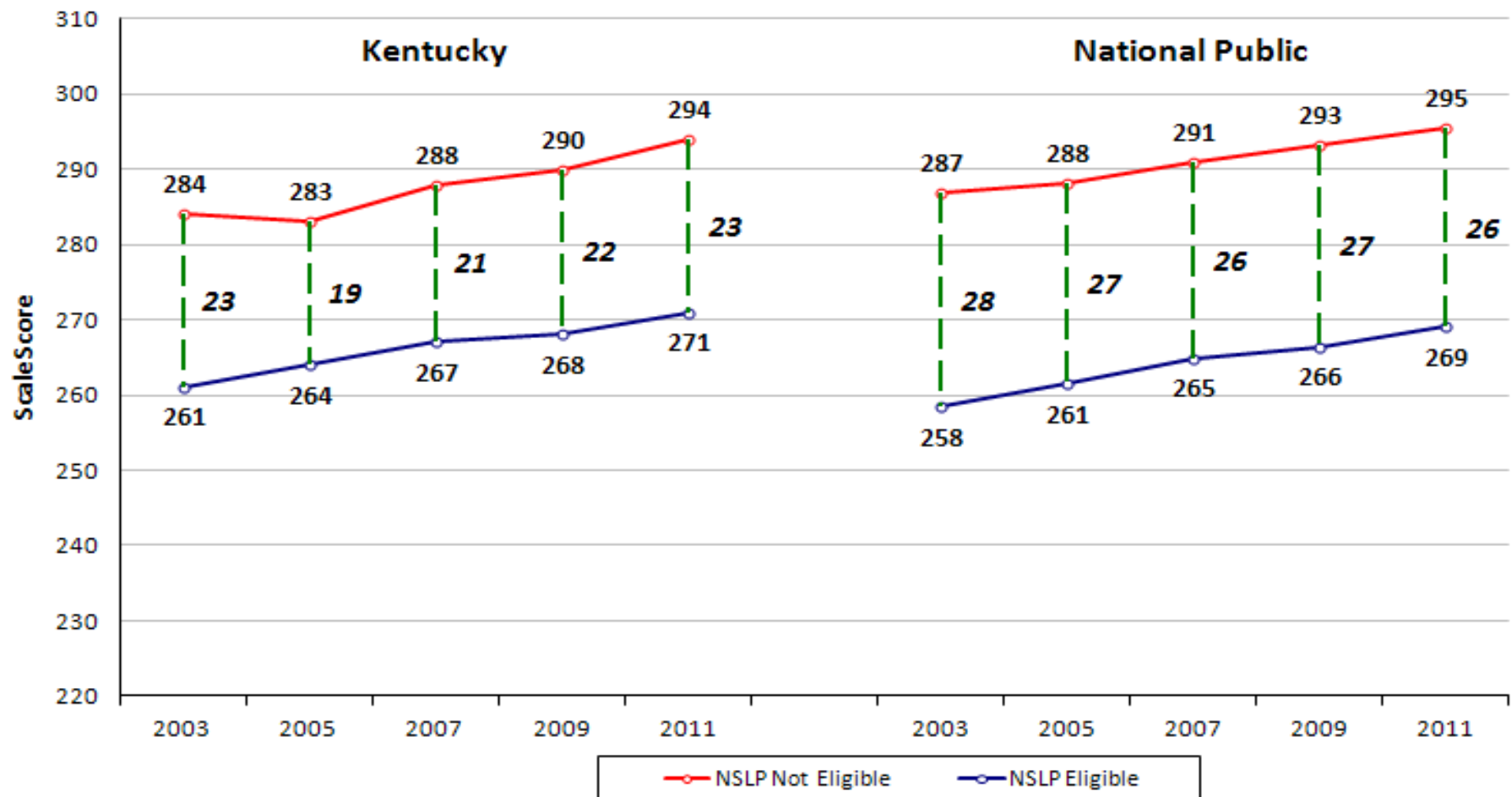


NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

2011 NSLP Not Eligible and Eligible GAP : Math Grade 8

NAEP Mathematics Grade 8 — National School Lunch Program
Gap - Average Scale Score: 2003-2011



NOTE: The NAEP Mathematics scale ranges from 0 to 500. Observed differences are not necessarily statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

2011 Math Exclusion Rates of SD and/or ELL – Grade 8



	Kentucky Exclusion Rate			Nation Exclusion Rate		
	2007	2009	2011	2007	2009	2011
Percentage	7*	5*	3	4*	3*	3
In 2011, 31 states and jurisdictions had lower rates of exclusion than Kentucky's rate.						
In 2011, 12 states had higher rates.						
In 2011, 9 states had equal rate.						

* Rates are rounded to nearest percentage

Math by Gender

Grades 4 and 8 – 2000 to 2011

	4 th Grade Male KY (Nation)	4 th Grade Female KY (Nation)	8 th Grade Male KY (Nation)	8 th Grade Female KY (Nation)
2000	220 (225)	219 (223)	271 (273)	269 (271)
2003	230 (235)	227 (233)	275 (277)	274 (275)
2005	233 (238)	230 (236)	275 (278)	273 (277)
2007	237 (240)	234 (238)	280 (281)	277 (279)
2009	240 (240)	238 (238)	281 (283)	278 (281)
2011	242(241)	240(239)	282(283)	281(282)

Math by Race

Grades 4 and 8 – 2000 to 2011

	4 th Grade White KY (Nation)	4 th Grade American - African KY (Nation)	8 th Grade White KY (Nation)	8 th Grade American - African KY (Nation)
2000	223 (233)	196 (203)	272 (283)	250 (243)
2003	231 (243)	214 (216)	277 (287)	250 (252)
2005	234 (246)	217 (220)	276 (288)	255 (254)
2007	238 (248)	219 (222)	282 (290)	257 (259)
2009	241(248)	220 (222)	282 (292)	258 (260)
2011	243(249)	225(224)	284(293)	261(262)

Math by Free/Reduced Lunch

Grades 4 and 8 – 2000 to 2011

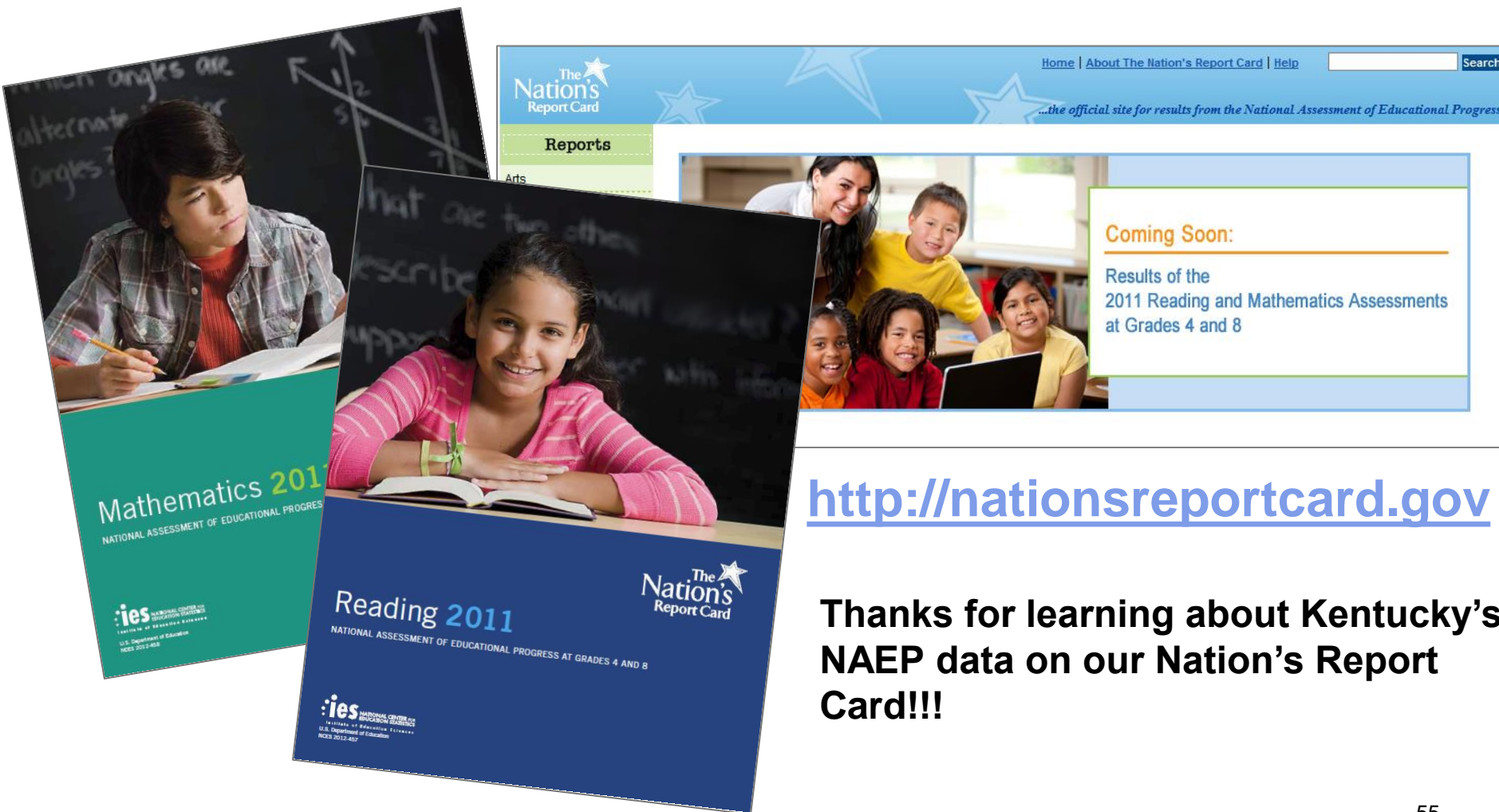
	4 th Grade Eligible - KY (Nation)	4 th Grade Not Eligible - KY (Nation)	8 th Grade Eligible – KY (Nation)	8 th Grade Not Eligible - KY (Nation)
2000	207 (208)	230 (235)	255 (253)	280 (283)
2003	220 (222)	237 (244)	261 (258)	284 (287)
2005	224 (225)	240 (248)	264 (261)	283 (288)
2007	226 (227)	245 (249)	267 (265)	288 (291)
2009	229 (228)	249 (250)	268 (266)	290 (293)
2011	232(229)	251(252)	271(269)	294(295)

Parent's Highest Level of Education Matters — 8th grade survey



2011	Did not graduate HS		Graduated HS only		Some Higher Education		Graduated College	
	KY	(Nation)	KY	(Nation)	KY	(Nation)	KY	(Nation)
Scale Score	267	(265)	272	(271)	281	(285)	293	(294)
	<i>% at or above Proficient</i>		<i>% at or above Proficient</i>		<i>% at or above Proficient</i>		<i>% at or above Proficient</i>	
Percent	16	(15)	19	(20)	27	(33)	44	(46)

For more information



The collage features three main elements:

- Mathematics 2011 Book Cover:** A green cover with a photo of a boy writing on a chalkboard. Text includes "Mathematics 2011", "NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS", and the IES logo.
- Reading 2011 Book Cover:** A blue cover with a photo of a girl reading. Text includes "Reading 2011", "NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS AT GRADES 4 AND 8", and the IES logo.
- The Nation's Report Card Website Screenshot:** A screenshot of the website's homepage. It features a blue header with the site's name, navigation links (Home, About The Nation's Report Card, Help), and a search bar. Below the header is a "Reports" section with a "Arts" link. A large image of a teacher and students is shown, with a "Coming Soon:" announcement for the "Results of the 2011 Reading and Mathematics Assessments at Grades 4 and 8".

<http://nationsreportcard.gov>

**Thanks for learning about Kentucky's
NAEP data on our Nation's Report
Card!!!**