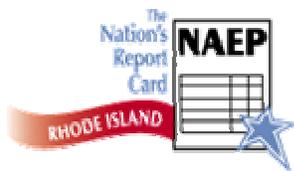




2003 Rhode Island NAEP Mathematics Report

NOVEMBER, 2003



KEY FINDINGS

For grade 4:

- The average mathematics scale score for students in Rhode Island was 230. This is an increase of fifteen scale score points from 1992 (215). *See page 7*
- The percentage of students in Rhode Island who performed at or above the *Proficient* level increased by 15% since 1992 (13%) and is now 28%. *See page 7*
- Among the five racial/ethnic categories, large gains have been made in reducing the percentage of students below *Basic* from 1992 to 2003. *See pages 16 - 17*
- Gaps between white and minority groups continue to close. *See pages 16 - 17*
- Significant increases were seen in the percentage of students eligible for Free/Reduced lunch reaching or exceeding the *Proficient* achievement level. *See page 20*
- Significant increases are seen in both the average scale score and the percent of students eligible for Free/Reduced Lunch reaching at or above *Proficient*. *See page 20*

For grade 8:

- The average mathematics scale score for students in Rhode Island was 272. This was an increase of twelve scale score points from 1992 (260). *See page 8*
- The percentage of students in Rhode Island who performed at or above the *Proficient* level was 24 percent. This was greater than that in 1990 (15 percent). *See page 8*
- The percentage of minority students reaching the *Basic* level has increased significantly since 1992 (*See pages 18 - 19*):
 - Hispanic increased 22%
 - Asian increased 26%
 - Black increased 18%
 - White decreased 1%
- An increase of ten scale score points from 2000 was seen among students eligible for Free/Reduced Lunch. *See page 20*

This report provides selected results from the National Assessment of Educational Progress (NAEP) for Rhode Island's public-school students at grades 4 and 8. Since 1990, mathematics has been assessed in five different years at the state level (at grade 8 in 1990 and at both grades 4 and 8 in 1992, 1996, 2000, and 2003). In 2003, 53 jurisdictions participated: the 50 states, District of Columbia, Department of Defense Domestic Dependent Elementary and Secondary Schools, and Department of Defense Dependents Schools (Overseas). Rhode Island participated and met the criteria for reporting public-school results at grade 8 in 1990 and at both grades 4 and 8 in 1992, 1996, 2000, and 2003.

NAEP is a project of the National Center for Education Statistics (NCES). For more information about the assessment, see *The Nation's Report Card, Mathematics Highlights 2003* or *The Nation's Report Card: Mathematics 2003*, which will be available in 2004. The full set of results is available in an interactive database on the NAEP web site (<http://nces.ed.gov/nationsreportcard/>). Released test questions, scoring guides, and question-level performance data are also available on the web site.

Introduction

How Is Student Mathematics Performance Reported?

The results of student performance on the NAEP assessments are reported for various groups of students. **NAEP does not produce scores for individual students or report scores for schools. Nor are the data produced for school districts.** Mathematics performance for groups of students is reported in two ways 1) average scale scores and 2) achievement levels.

Scale Scores: Student performance is reported as an average score based on the NAEP mathematics scale, which ranges from 0 to 500 and is linked to the corresponding scales in 1990, 1992, 1996, and 2000. Subscales were created to report performance on each of the contexts for reading defined in the NAEP reading framework. An overall composite scale was developed by weighting each of the mathematics subscales for the grade (two at grade 4 and three at grade 8) based on its relative importance in the framework. This composite scale is the metric used to present the average scale scores and selected percentiles used in NAEP reports.

Achievement Levels: Student mathematics performance is also reported in terms of three achievement levels—*Basic*, *Proficient*, and *Advanced*. Results based on achievement levels are expressed in terms of the percentage of students who attained each level. The three achievement levels are defined as follows:

- *Basic:* This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
- *Proficient:* This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
- *Advanced:* This level signifies superior performance.

The achievement levels are performance standards adopted by the National Assessment Governing Board (NAGB) as part of its statutory responsibilities mandated by Congress. The levels represent collective judgments of what students should know and be able to do for each grade tested. They are based on recommendations made by broadly representative panels of classroom teachers, education specialists, and members of the general public. The mathematics achievement-level descriptions are summarized for grades 4 and 8 in figures 1A and 1B.

Descriptions of NAEP mathematics achievement levels, grade 4

<p><i>Advanced</i> Level</p> <p>Cut Score: 282</p>	<p>Fourth-grade students performing at the <i>Advanced</i> level should apply integrated procedural knowledge and conceptual understanding to complex and non-routine real-world problem solving in the five NAEP content strands.</p> <p>Fourth-graders performing at the <i>Advanced</i> level should be able to solve complex and non-routine real world problems in all NAEP content area strands. They should display mastery in the use of four-function calculators, rulers, and geometric shapes. The students are expected to draw logical conclusions and justify answers and solution processes by explaining why, as well as how, they were achieved. They should go beyond the obvious in their interpretations and be able to communicate their thoughts clearly and concisely.</p>
<p><i>Proficient</i> Level</p> <p>Cut Score: 249</p>	<p>Fourth-grade students performing at the <i>Proficient</i> level should consistently apply integrated procedural knowledge and conceptual understanding to problem solving in the five NAEP content strands.</p> <p>Fourth-grade students performing at the <i>Proficient</i> level should be able to use whole numbers to estimate, compute, and determine whether results are reasonable. They should have a conceptual understanding of fractions and decimals; be able to solve real-world problems in all NAEP content areas; and use four-function calculators, rulers and geometric shapes appropriately. Students performing at the <i>Proficient</i> level should employ problem-solving strategies such as identifying and using appropriate information. Their written solutions should be organized and presented both with supporting information and explanations of how they were achieved.</p>
<p><i>Basic</i> Level</p> <p>Cut Score: 214</p>	<p>Fourth-grade students performing at the <i>Basic</i> level should show some evidence of understanding the mathematical concepts and procedures in the five NAEP content strands.</p> <p>Fourth graders performing at the <i>Basic</i> level should be able to estimate and use basic facts to perform simple computations with whole numbers, show some understanding of fractions and decimals, and solve some simple real-world problems in all NAEP content areas. Students at this level should be able to use – although not always accurately- four-function calculators, rulers, and geometric shapes. Their written responses are often minimal and presented without supporting information.</p>

1B

Descriptions of NAEP mathematics achievement levels, grade 8.

The following was excerpted from the *Mathematics Framework for the 2003 National Assessment of Educational Progress* at <http://www.nagb.org/>

<p><i>Advanced</i> Level Cut Score: 333</p>	<p>Eighth-grade students performing at the <i>Advanced</i> level should be able to reach beyond the recognition, identification, and application of mathematical rules in order to generalize and synthesize concepts and principles in the five NAEP content strands.</p> <p>Eighth-graders performing at the <i>Advanced</i> level should be able to probe examples and counterexamples in order to shape generalizations from which they can develop models. Eighth-graders performing at the <i>Advanced</i> level should use number sense and geometric awareness to consider the reasonableness of an answer. They are expected to use abstract thinking to create unique problem-solving techniques and explain the reasoning process underlying their conclusions.</p>
<p><i>Proficient</i> Level Cut Score: 299</p>	<p>Eighth-grade students performing at the <i>Proficient</i> level should apply mathematical concepts and procedures consistently to complex problems in the five NAEP content strands.</p> <p>Eighth-grade students performing at the <i>Proficient</i> level should be able to conjecture, defend their ideas, and give supporting examples. They should understand the connections between fractions, percents, decimals, and other mathematical topics such as algebra and functions. Students at this level are expected to have a thorough understanding of <i>Basic</i> level arithmetic operations – an understanding sufficient for problem solving in practical situations.</p> <p>Quality and spatial relationships in problem solving and reasoning should be familiar to them, and they should be able to convey underlying reasoning skills beyond the level arithmetic. They should be able to compare and contrast mathematical ideas and generate their own examples. These students should make inferences from data and graphs; apply properties of informal geometry; and accurately use the tools of technology. Students at this level should understand the process of gathering and organizing data and be able to calculate, evaluate, and communicate results within the domain of statistics and probability.</p>
<p><i>Basic</i> Level Cut Score: 262</p>	<p>Eighth-grade students performing at the <i>Basic</i> level should exhibit evidence of conceptual and procedural understanding in the five NAEP content strands. This level of performance signifies an understanding of arithmetic operations – including estimation – on whole numbers, decimals, fractions, and percents.</p> <p>Eighth graders performing at the <i>Basic</i> level should complete problems correctly with the help of structural prompts such as diagrams, charts, and graphs. They should be able to solve problems in all NAEP content strands through the appropriate selection and use of strategies and technological tools – including calculators, computers, and geometric shapes. Students at this level also should be able to use fundamental algebraic and informal geometric concepts in problem solving.</p> <p>As they approach the proficient level, students at the <i>Basic</i> level should be able to determine which of the available data are necessary and sufficient for correct solutions and use them in problem solving. However, these eighth graders show limited skill in communicating mathematically.</p>

NAEP Mathematics 2003 Overall Scale Score and Achievement-Level Results for Rhode Island Students

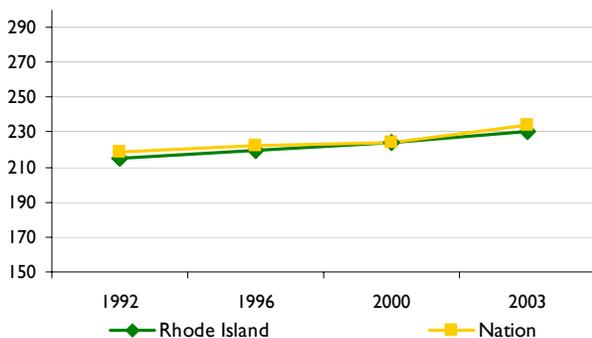
Overall Scale Score Results ♦ In this section student performance is reported as an average score based on the NAEP mathematics scale, which ranges from 0 to 500. Scores on this scale are comparable from 1996 through 2003. Figures 1A and 1B show the overall performance results of grades 4 and 8 public school students in Rhode Island and the nation.

FIGURE 1A The Nation's Report Card 2003 State Assessment
Average mathematics scale scores and percent at each achievement level, grade 4 public schools: 1992 - 2003

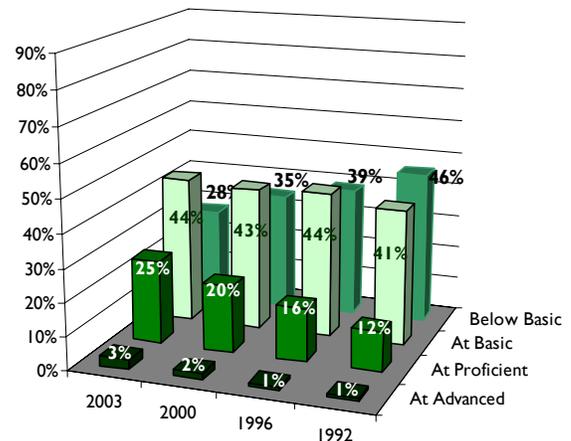
In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

		Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or Above Basic	At or Above Proficient	
Grade 4	2003	Rhode Island	230	28	44	25	3	72	28
		Nation	234	24	45	27	4	76	31
2000	Rhode Island	224*	35*	43	20	2*	65*	22*	
	Nation	224*	36*	42	20	2*	64*	22*	
1996	Rhode Island	220*	39*	44	16	1*	61*	17*	
	Nation	222*	38*	42	18	2*	62*	20*	
1992	Rhode Island	215*	46*	41	12	1*	54*	13*	
	Nation	219*	43*	40	15	2*	57*	17*	

Average Scale Score of Fourth Graders in Rhode Island (1992 - 2003) by All Students: NAEP Mathematics



Percent of Fourth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



FIGURE

The Nation's Report Card 2003 State Assessment

1B

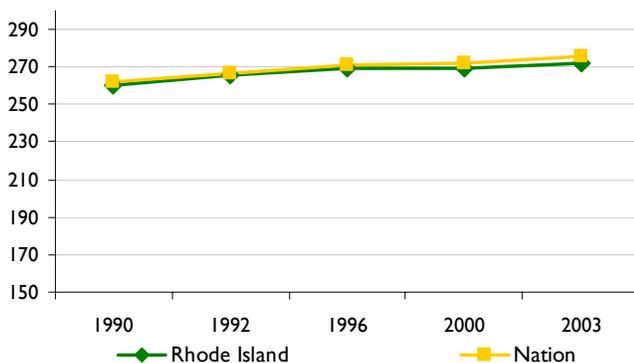
Average mathematics scale scores and percent at each achievement level, grade 8 public schools: 1990 - 2003

In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

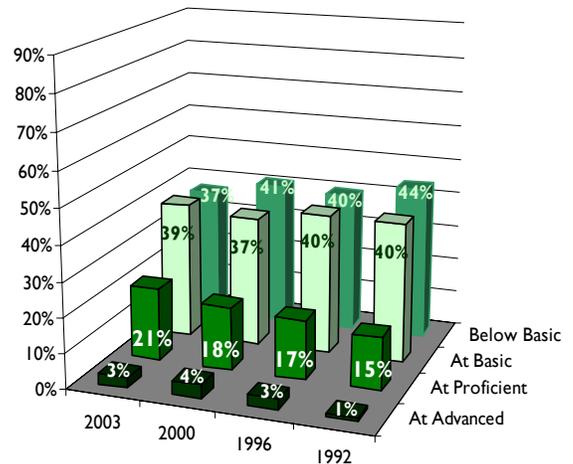
		Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or Above Basic	At or Above Proficient
Grade 8								
2003								
	Rhode Island	272	37	39	21	3	63	24
	Nation	276	33	40	22	5	67	27
2000								
	Rhode Island	269*	41*	37	18	4*	59*	22*
	Nation	272*	38*	37	20	5*	62*	25*
1996								
	Rhode Island	269*	40*	40	17	3*	60*	20*
	Nation	271*	39*	38	19	4*	61*	23*
1992								
	Rhode Island	266*	44*	40	15	1*	56*	16*
	Nation	267*	44*	36	17	3*	56*	20*
1990								
	Rhode Island	260*	51*	34	13	2*	49*	15*
	Nation	262*	49*	36	15	2*	51*	15*

Grade 8 Scale Score Results

Average Scale Score of Eighth Graders in Rhode Island (1990 - 2003) by All Students: NAEP Mathematics



Percent of Black Eighth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



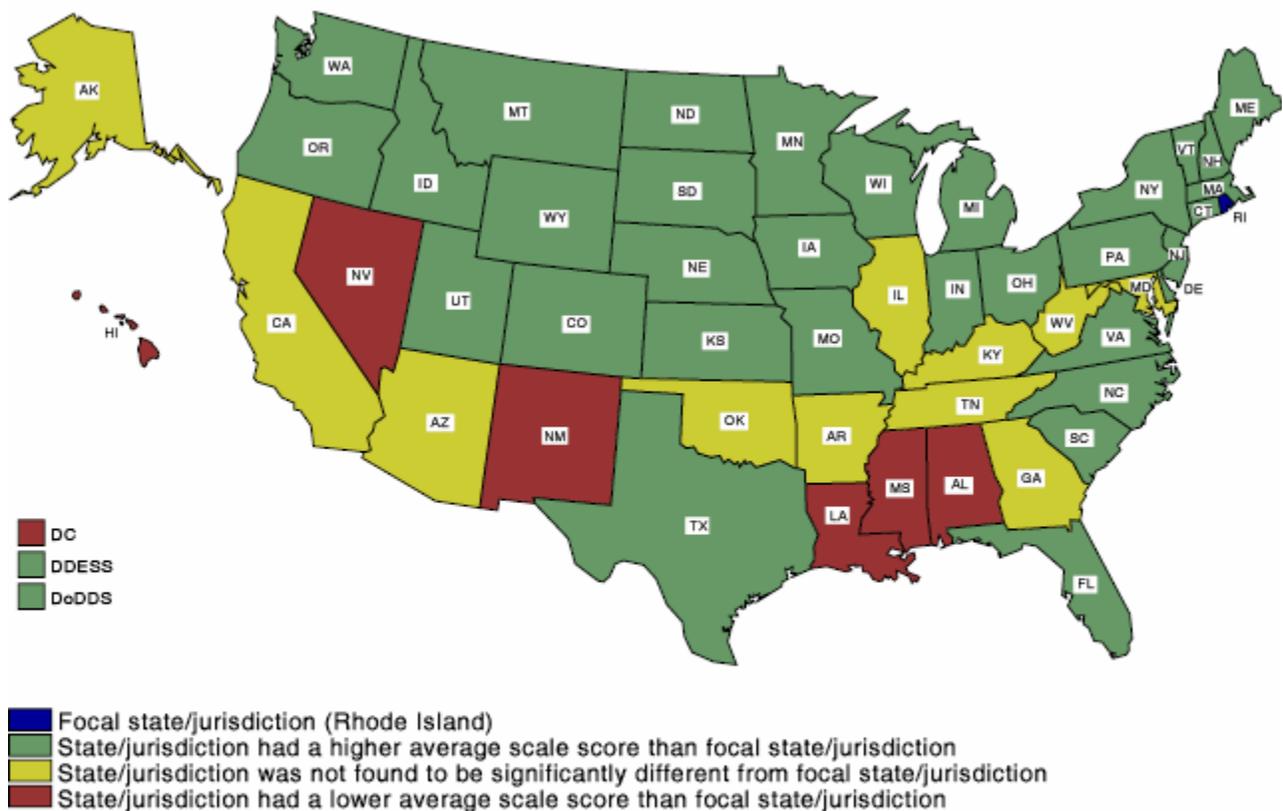
Comparisons between Rhode Island and Other Participating States and Jurisdictions

In 2003, 53 jurisdictions participated in the mathematics assessment. These include the 50 states, the District of Columbia and the two groups of Department of Defense Education Activity (DoDEA) schools: Domestic Dependent Elementary and Secondary Schools (DDESS) and Department of Defense Dependents Schools (DoDDS).

Comparisons by Average Scale Scores

Figures 2A and 2B compare Rhode Island's 2003 overall mathematics scale scores at grades 4 and 8 with those of all other participating states and jurisdictions. The different shadings indicate whether a state's or jurisdiction's average scale score was found to be higher than, lower than, or not significantly different from that of Rhode Island in the NAEP 2003 mathematics assessment.

FIGURE 2A The Nation's Report Card 2003 State Assessment
Rhode Island's average mathematics scale score compared with scores for other participating jurisdictions, grade 4 public schools: 2003



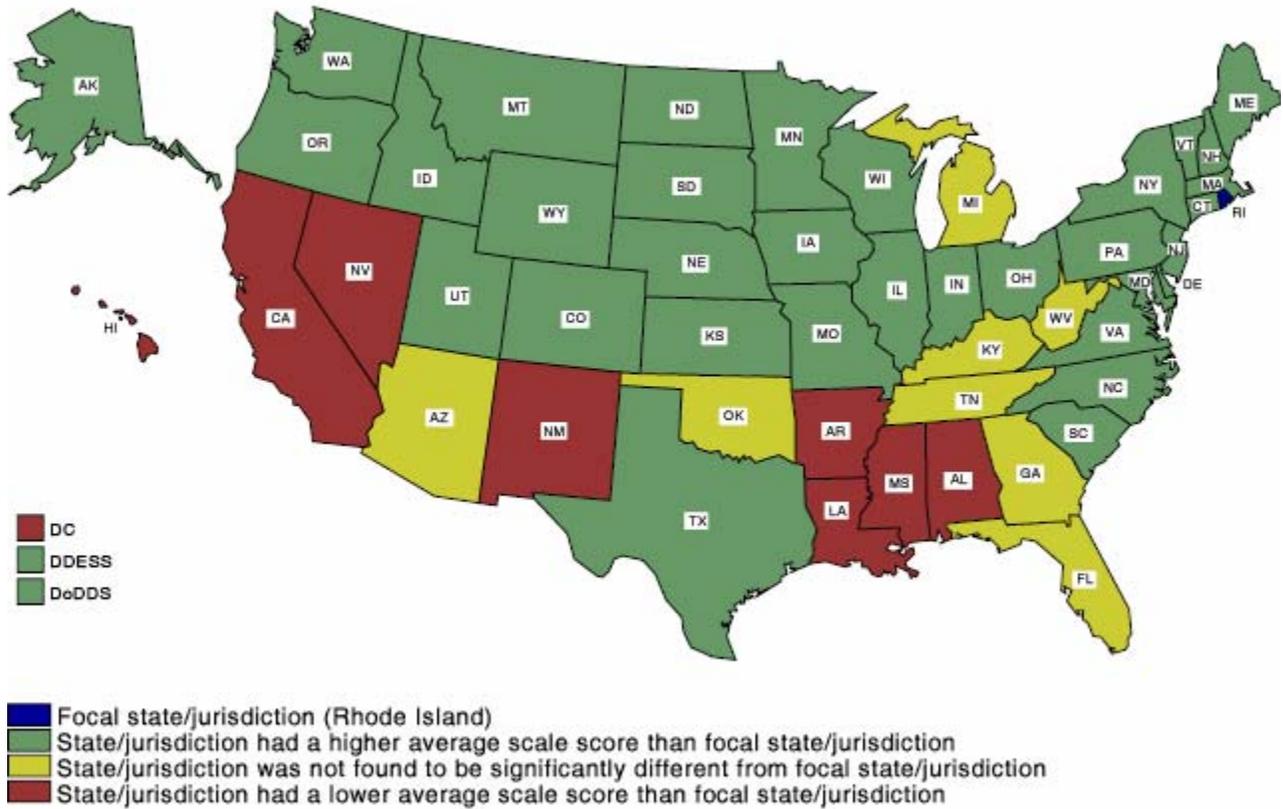
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
 DoDDS: Department of Defense Dependents Schools (Overseas).
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment.

FIGURE

The Nation's Report Card 2003 State Assessment

2B

Rhode Island's average mathematics scale score compared with scores for other participating jurisdictions, grade 8 public schools: 2003



DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

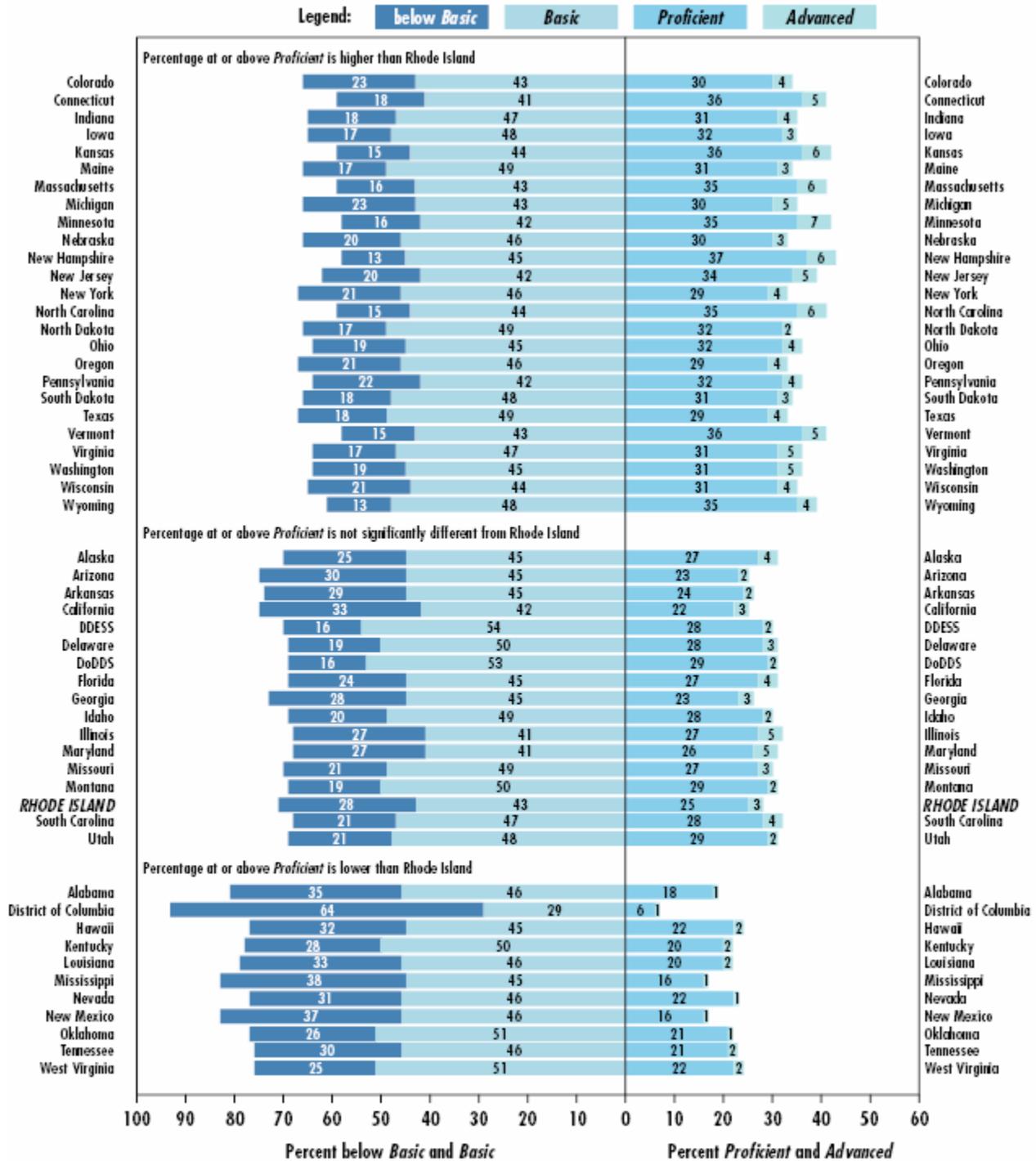
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment.

FIGURE

The Nation's Report Card 2003 State Assessment

3A

Percentage of students at or above each mathematics achievement level range, and Rhode Island's percentage at or above *Proficient* compared with other participating jurisdictions, grade 4 public schools: By state, 2003. States are listed in alphabetical order within categories.



DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

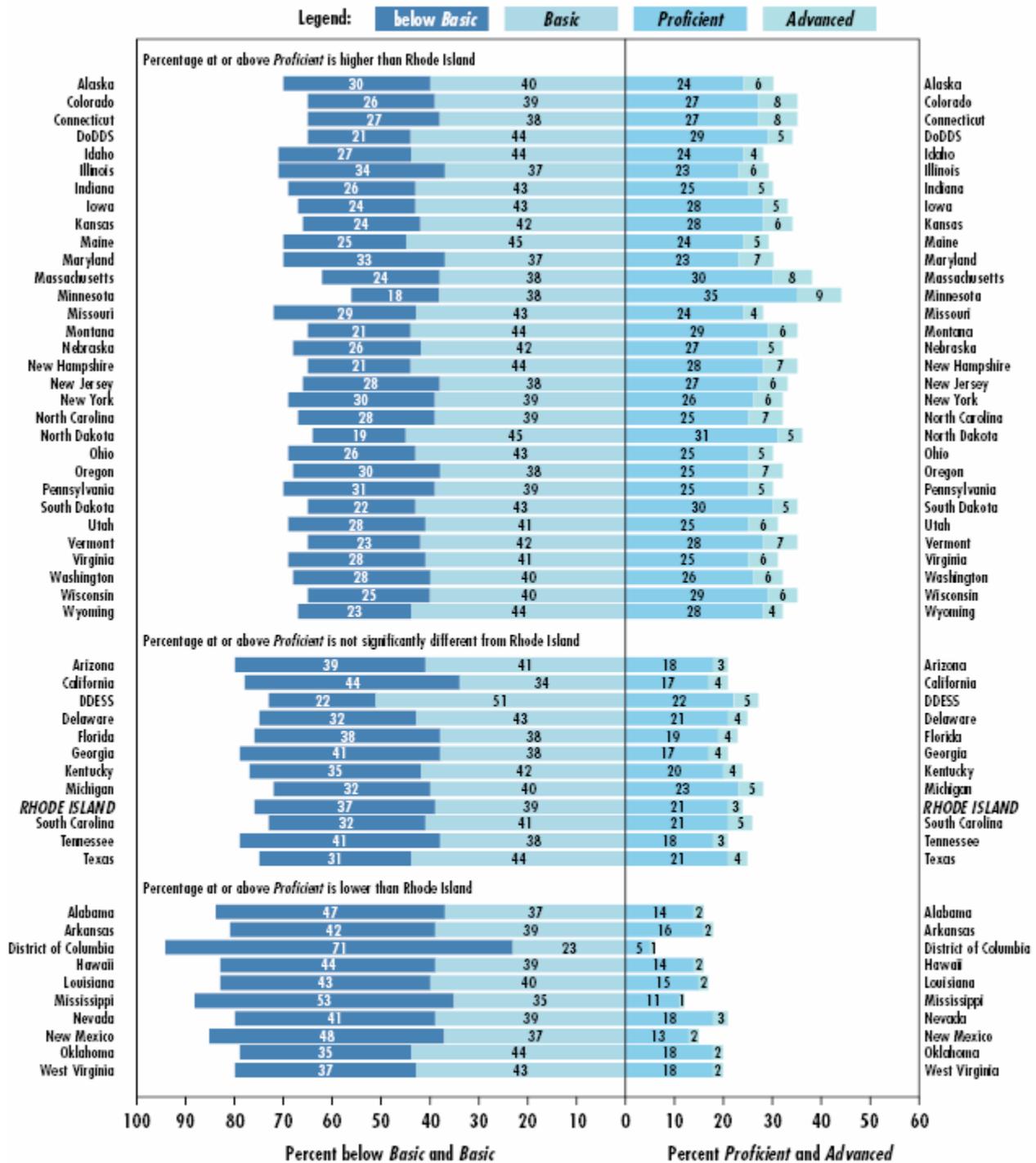
DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: The bars above contain percentages of students in each NAEP mathematics achievement range. Achievement levels corresponding to each population of students are aligned at the point where the *Proficient* category begins, so that they may be compared at *Proficient* and above. Detail may not sum to totals because of rounding.

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

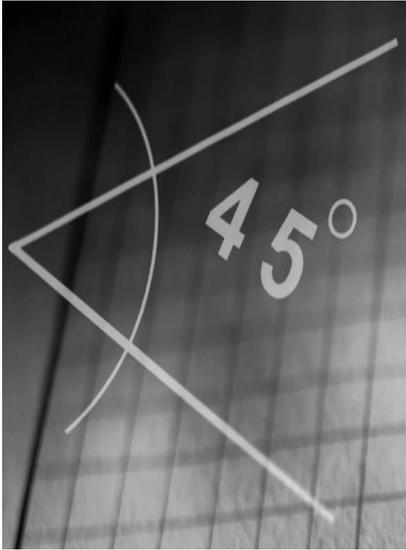
3B

Percentage of students at or above each mathematics achievement level range, and Rhode Island's percentage at or above *Proficient* compared with other participating jurisdictions, grade 8 public schools: By state, 2003. States are listed in alphabetical order within categories.



DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
 DoDDS: Department of Defense Dependents Schools (Overseas).
 NOTE: The bars above contain percentages of students in each NAEP mathematics achievement range. Achievement levels corresponding to each population of students are aligned at the point where the *Proficient* category begins, so that they may be compared at *Proficient* and above. Detail may not sum to totals because of rounding.
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment.

Mathematics Performance by Demographic Characteristics



This section of the report presents trend results for students in Rhode Island and the nation by demographic characteristics. Student performance data are reported for:

1. Gender
2. Race/Ethnicity
3. Eligibility for free/reduced school lunch
4. Students with disabilities
5. LEP/ESL status

The reader is cautioned against making causal inferences about the performance of groups of students relative to demographic variables. Many factors other than those discussed here, including home and school factors, may affect student performance. Average scale scores and achievement levels for 2003 were not reported for students receiving Title I services.

NAEP collects information on many additional variables, including school and home factors related to achievement. All of this information is in an interactive database available on the NAEP web site (<http://nces.ed.gov/nationsreportcard/naepdata/>).

Accommodated Sessions: The 2000 NAEP Mathematics assessment was administered both with and without accommodations. For the purposes of this report, data from the sample which permitted accommodations is used. In years prior to 2000, accommodations were not permitted; these years are below the line in the charts on the following pages.

Statistical Significance: (*) signifies a statistically significant change as compared to the 2003 value.

Gender ♦ Information on student gender is reported by schools on rosters of students eligible to be assessed. In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

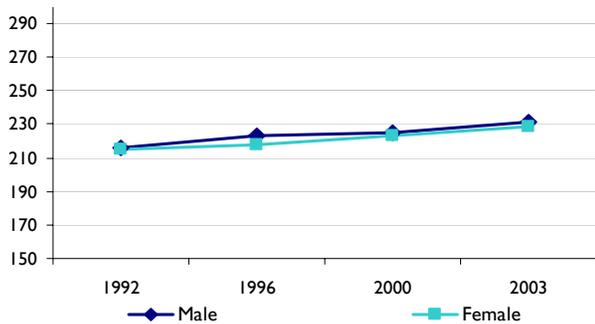
The Nation's Report Card 2003 State Assessment for Rhode Island Grade 4 Average Mathematics Scale Scores and Percentages of Students by Achievement Levels by Gender

		Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or above Basic	At or above Proficient
Grade 4 Male								
	2003	231	27	44	26	3	73	29
	2000	225*	34*	41	23	2	66*	25*
	1996	223*	37*	43	18	2	63*	20*
	1992	216*	45*	40	13	2	55*	15*
Grade 4 Female								
	2003	229	30	43	24	3	70	27
	2000	223*	35	46	18	1	65	19*
	1996	218*	41*	45	13	1*	59	14*
	1992	215*	47*	41	13	1	53	12*

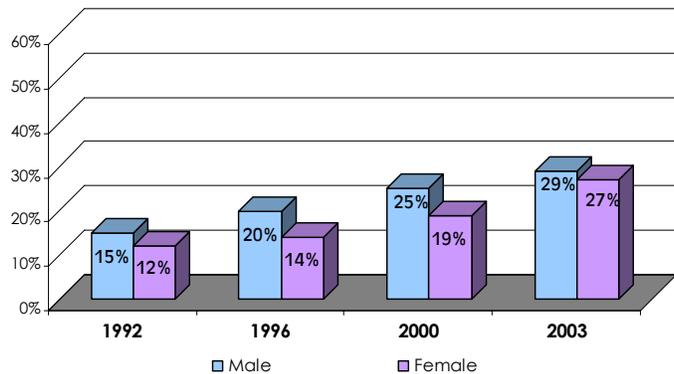
Findings:

- ▶ From 1992 to 2003, the percentage of students below the *Basic* achievement level has decreased by 18% for boys and 17% for girls.
- ▶ Over the years, the percentage of boys and girls at or above the *Basic* and *Proficient* levels has increased at the same rate.
- ▶ Because both the boys and the girls have increased not only in their Average Scale Scores but also the percent at or above *Basic* and *Proficient*, this has kept the gender gap at a statistically insignificant amount.

Average Scale Score of Fourth Graders in Rhode Island (1992 - 2003) by Gender: NAEP Mathematics



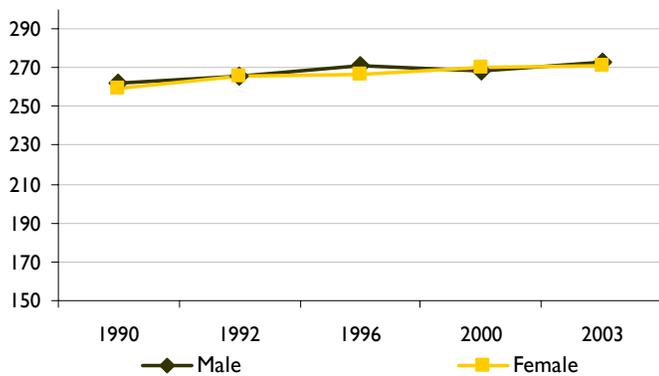
Percent of 4th Grade Students in Rhode Island at or above Proficient in NAEP Mathematics 1992 - 2003: By Gender



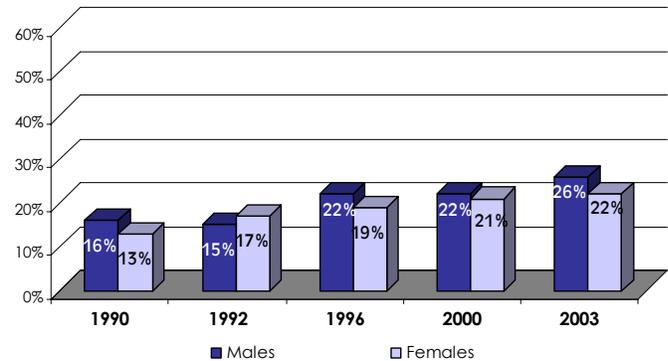
The Nation's Report Card 2003 State Assessment for Rhode Island Grade 8 Average Mathematics Scale Scores and Percentages of Students by Achievement Levels by Gender

		Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or above Basic	At or above Proficient
Grade 8 Male								
	2003	273	37	37	23	3	63	26
	2000	268	41	38	17	4	59	21*
	1996	271	38	40	19	3	62	22
	1992	266*	44*	39	16	1*	56*	17*
	1990	262*	50*	34	14	2	50*	16*
Grade 8 Female								
	2003	271	38	40	19	3	62	22
	2000	270	40	38	18	4	60	22
	1996	267*	42	39	17	2	58	19
	1992	266*	45*	42	14	1	57	15
	1990	259*	52*	35	12	1	48	13

Average Scale Score of Eighth Graders in Rhode Island (1990 - 2003) by Gender: NAEP Mathematics



Percent of 8th Grade Students in Rhode Island at or above Proficient in NAEP Mathematics 1990 - 2003: By Gender



Findings:

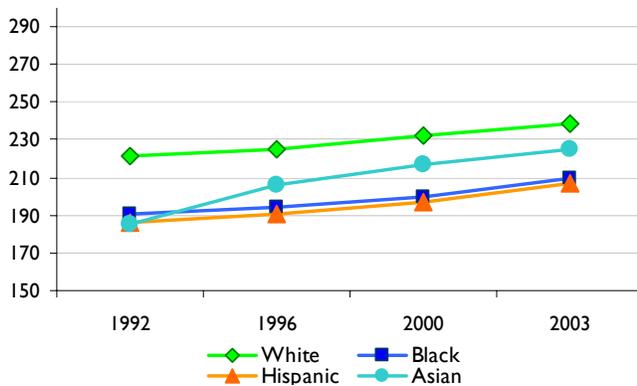
- The gap between males and females has remained small since 1990. In 2003 the gap is two scale score points.
- The increase in the average scale score among males in 1990 was 262 (at the *Basic* achievement level) and increased to 273 (the *Proficient* level) in 2003.
- The average scale score among female eighth graders was 259 in 1990 (the below *Basic* level). In 2003 that score increased by twelve scale score points to 271; the middle of the *Proficient* achievement level.
- Sixty-two percent of females are reaching the at/above *Basic* level whereas 48% of females were reaching the same level in 1990. This is an increase of 14%.

Race/Ethnicity ♦ Information on student race/ethnicity is reported by schools on rosters of students eligible to be assessed. In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

**The Nation's Report Card 2003 State Assessment for Rhode Island
Grade 4 Average Mathematics Scale Scores and
Percentages of Students by Achievement Levels by Race/Ethnicity**

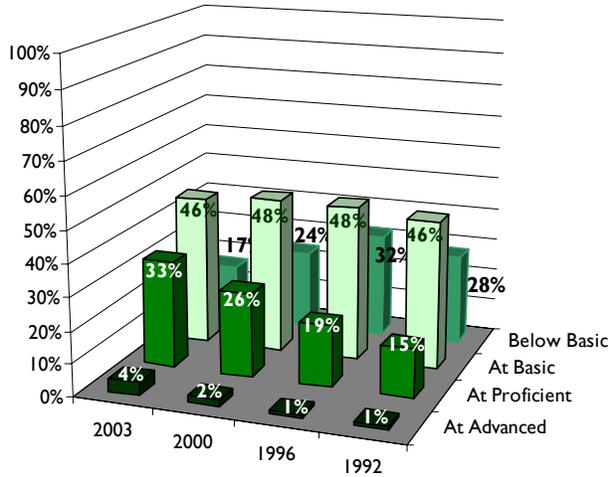
Grade 4	Average Score	Below Basic	Achievement Levels				
			At Basic	At Proficient	At Advanced	At or above Basic	
White							
2003	239	17	46	33	4	83	37
2000	232*	24*	48	26	2*	76*	28*
1996	225*	32*	48	19	1*	68*	20*
1992	221	28	46	15	1	62	16
Black							
2003	210	55	38	7	0	45	7
2000	200*	67*	30	3	0	33*	3
1996	194*	74*	23	3	0	26*	3
1992	191	78	20	2	0	22	2
Hispanic							
2003	207*	58	36	6	0	42	6
2000	197*	71*	26	3	0	29*	3*
1996	191*	77*	21	2	0	23*	2
1992	186*	85*	14	1	0	15*	1
Asian/Pacific Islander							
2003	225	37	41	18	4	63	22
2000	217	48	34	16	2	52	18
1996	206*	61*	28	8	3	39*	11*
1992	185	84*	15	1	0	16*	1*
American Indian/ Alaska Native							
2003	---	---	---	---	---	---	---
2000	---	---	---	---	---	---	---
1996	---	---	---	---	---	---	---
1992	---	---	---	---	---	---	---

Average Scale Score of Fourth Graders in Rhode Island (1992 - 2003) by Race/Ethnicity: NAEP Mathematics

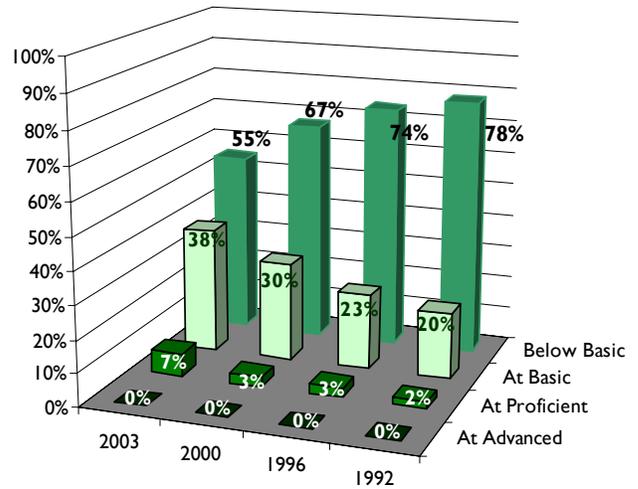


The Nation's Report Card 2003 State Assessment for Rhode Island Grade 4 Average Mathematics Scale Scores and Percentages of Students by Achievement Levels by Race/Ethnicity

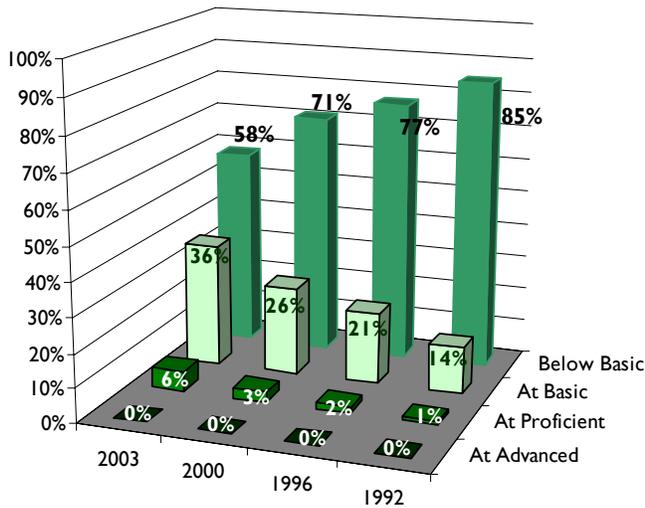
Percent of White Fourth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



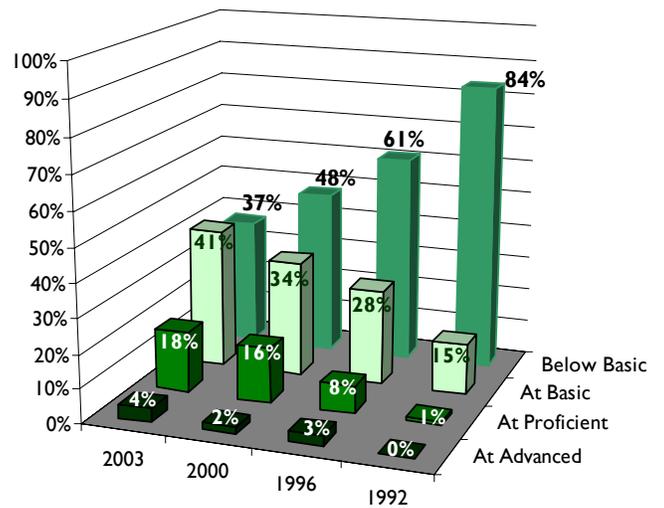
Percent of Black Fourth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



Percent of Hispanic Fourth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



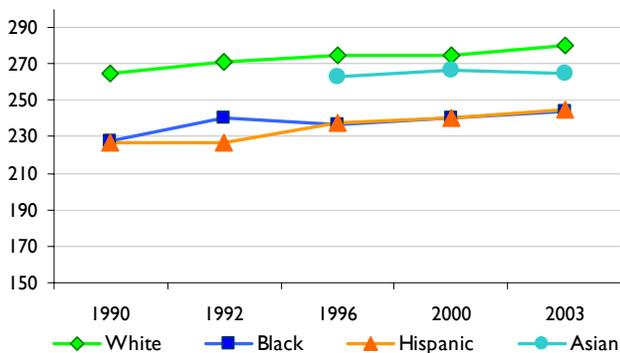
Percent of Asian Fourth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



**The Nation's Report Card 2003 State Assessment for Rhode Island
Grade 8 Average Mathematics Scale Scores and
Percentages of Students by Achievement Levels by Race/Ethnicity**

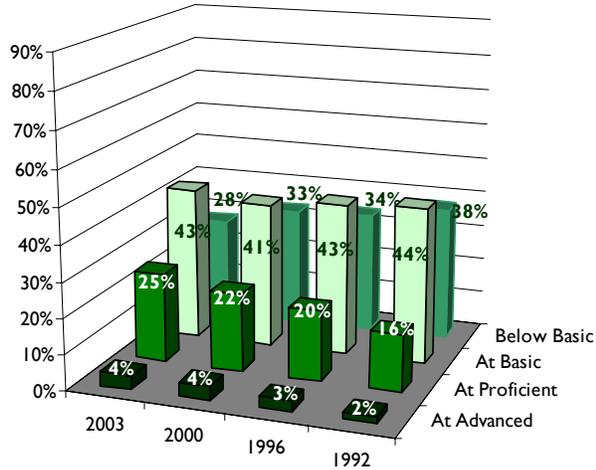
	Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or above Basic	At or above Proficient
Grade 8							
White							
2003	280	28	43	25	4	72	29
2000	275*	33	41	22	4	67	26
1996	275*	34*	43	20	3	66	23*
1992	271*	38*	44	16	2*	62*	18*
1990	265*	46*	38	14	2*	54*	16*
Black							
2003	244	71	25	5	0	29	5
2000	240	77	19	3	1	23	4
1996	237	78	16	6	0	22	6
1992	240	72	26	2	0	28	2
1990	228*	86*	12	2	0	14*	2
Hispanic							
2003	245	71	25	5	0	29	5
2000	240	74	23	3	0	26	3
1996	238	74	23	3	0	26	3
1992	227*	85*	13	2	0	15*	2*
1990	227*	87*	12	1	0	13*	1*
Asian/Pacific Islander							
2003	265	46	34	18	2	54	20
2000	267	46	34	14	6	54	20
1996	263	48	36	15	1	52	16
1992	---	---	---	---	---	---	---
1990	---	---	---	---	---	---	---
American Indian/Alaska Native							
2003	---	---	---	---	---	---	---
2000	---	---	---	---	---	---	---
1996	---	---	---	---	---	---	---
1992	---	---	---	---	---	---	---
1990	---	---	---	---	---	---	---

**Average Scale Score of Eighth Graders in Rhode Island
(1990 - 2003) by Race/Ethnicity: NAEP Mathematics**
(There were not enough Asian students for reliable sample from 1990 - 1992)

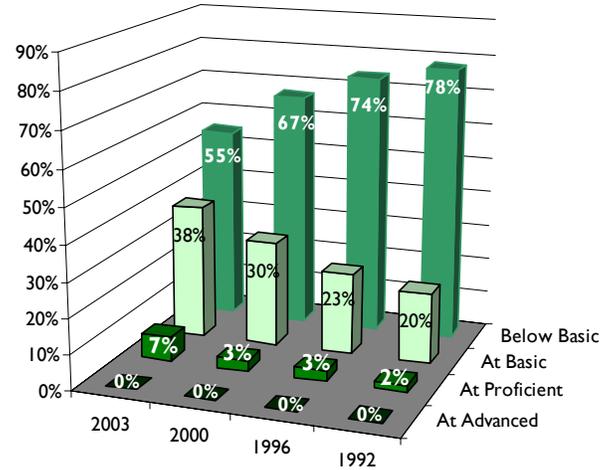


The Nation's Report Card 2003 State Assessment for Rhode Island Grade 8 Average Mathematics Scale Scores and Percentages of Students by Achievement Levels by Race/Ethnicity

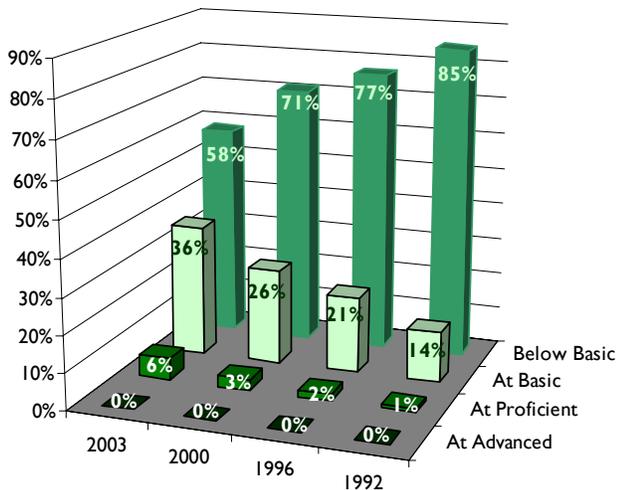
Percent of White Eighth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



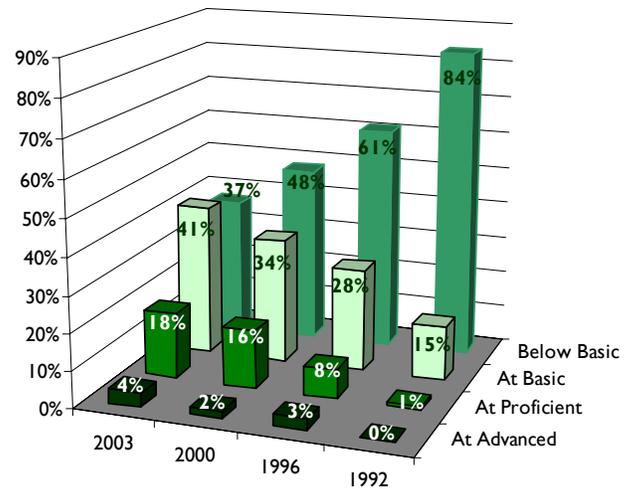
Percent of Black Eighth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



Percent of Hispanic Eighth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



Percent of Asian Eighth Grade Students at Each Achievement Level: NAEP Mathematics (1992 - 2003)



Free/Reduced Lunch Status ♦ Information on free/reduced lunch status is reported by schools on rosters of students eligible to be assessed. NAEP collects data on eligibility for the federal program providing free or reduced-price school lunches. The free/reduced-price lunch component of the National School Lunch Program (NSLP) offered through the U.S. Department of Agriculture (USDA) is designed to ensure that children near or below the poverty line receive nourishing meals. NAEP first collected information on participation in this program in 1996.

In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

**The Nation's Report Card 2003 State Assessment for Rhode Island
Grades 4 and 8 Average Mathematics Scale Scores and
Percentages of Students by Achievement Levels by Free/Reduced Lunch Status: 2003**

	Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or above Basic	At or above Proficient
Grade 4							
Eligible							
2003	217	45	42	12	1	55	13
2000	207*	57*	36	7	0	43*	7*
1996	204*	60	35	5	0	40	5
Not Eligible							
2003	242	14	45	36	5	86	41
2000	236*	19*	49	29	3	81*	32*
1996	229*	28	48	22	2	72*	24*
Grade 8							
Eligible							
2003	253	59	33	7	1	41	8
2000	247*	66	28	5	1	34	6
1996	250	62	30	8	0	38	8
Not Eligible							
2003	284	23	44	28	5	77	33
2000	280*	28	42	25	5	72	30
1996	277*	30	44	23	3	70*	26*

Findings for Grade 4:

- › The average scale score of grade 4 students eligible for Free/Reduced lunch has increased significantly from 2000 (207) to 2003 (217).
- › The percentage of students below *Basic* has decreased from 2000 to 2003 by twelve percent. This is a statistically significant change.
- › The percentage of fourth graders at the *Basic*, *Proficient*, and *Advanced* levels has increased significantly from 2000 to 2003.

Students with Disabilities

Information on disability status is reported by schools on rosters of students eligible to be assessed. In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

	Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or above Basic	At or above Proficient
Grade 4							
Eligible							
2003	210	56	35	8	1	44	9
2000	210	54	34	12	0	46	12
Not Eligible							
2003	235	22	45	30	3	78	33
2000	226*	31*	45	22	2*	69*	24*
Grade 8							
Eligible							
2003	244	69	23	8	0	31	8
2000	236	77	19	2	2	23	4
Not Eligible							
2003	278	30	43	23	4	70	27
2000	274*	35	40	21	4	65	25

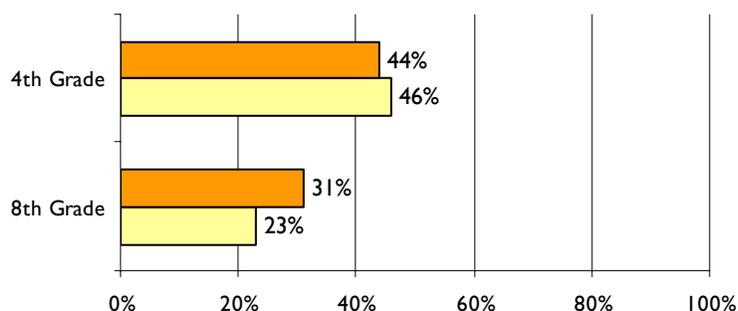
Findings for Fourth Grade:

- ▶ The average scale score for students with disabilities has not changed since 2000 (210).
- ▶ The average scale score among students without disabilities has increased ten scale score points since 2000. The percentage of students at/above *Proficient* has increased from 24% (2000) to 33% (2003). This is a difference of nine percent.
- ▶ The percentage of students with disabilities at/above *Proficient* has decreased by two percent.

Findings for Eighth Grade:

- ▶ The average scale score among students with disabilities has increased from 236 (2000) to 244 (2003); an increase of eight scale score points.
- ▶ The percentage of students with disabilities at or above *Basic* has increased ten percent since 2000.

Percent of Students with Disabilities at or above the Basic Achievement Level 2000 - 2003: NAEP Mathematics



LEP/ESL Status ♦ Information on student LEP/ESL status is reported by schools on rosters of students eligible to be assessed. In years 1992 and 1996, accommodations were not available for students. In years 2000 and 2003 accommodations were available for students. Statistically significant change is determined by comparing past years' data to the data in 2003 only and only for the average scale score and selected achievement levels.

	Average Score	Below Basic	At Basic	At Proficient	At Advanced	At or above Basic	At or above Proficient
Grade 4							
Eligible							
2003	196	77	20	2	1	23	3
2000	182	87	10	3	0	13	3
Not Eligible							
2003	233	24	46	27	3	76	30
2000	227*	31*	46	21	2*	69	23*
Grade 8							
Eligible							
2003	228	87	10	3	0	13	3
2000	---	---	---	---	---	---	---
Not Eligible							
2003	274	35	40	22	3	65	25
2000	271*	39	39	18	4	61	22

Findings for Fourth Grade:

- ▶ The average scale score for LEP students has increased 14 scale score points since 2000.
- ▶ The percentage of LEP students at or above *Basic* has increased ten percent since 2000.

Findings for Eighth Grade:

- ▶ For the 2000 mathematics assessment there were not enough students to report reliable results. For the 2003 assessment, performance of LEP students can be reported. The most notable difference between LEP and non-LEP-identified students at the eighth grade is the gap in the percentage of students reaching proficiency: three percent of LEP students and 25% of non-LEP students.

Descriptions of the Five Mathematics Content Area Strands

The following figure describes the five content areas that constitute the NAEP mathematics assessment. These content areas apply to each of the three grades assessed by NAEP. The questions designed to test the various content areas at a particular grade level tend to reflect the expectations normally associated with instruction at that grade level. *The following was excerpted from the Mathematics Framework for the 2003 National Assessment of Educational Progress at <http://www.nagb.org/>*

DESCRIPTIONS OF THE FIVE NAEP MATHEMATICS CONTENT AREAS	
Number Sense, Properties, and Operations	This content area focuses on students' understanding of numbers (whole numbers, fractions, decimals, integers, real numbers, and complex numbers), operations, and estimation, and their application to real-world situations. At grade 4, the emphasis is on the development of number sense through connecting various models to their numerical representations, and an understanding of the meaning of addition, subtraction, multiplication, and division. At grade 8, number sense is extended to include positive and negative numbers, as well as properties and operations involving whole numbers, fractions, decimals, integers, and rational numbers.
Measurement	This content area focuses on an understanding of the process of measurement and the use of numbers and measures to describe and compare mathematical and real-world objects. Students are asked to identify attributes, select appropriate units and tools, apply measurement concepts, and communicate measurement-related ideas. At grade 4, the focus is on time, money, temperature, length, perimeter, area, capacity, weight/mass, and angle measure. At grade 8, this content area includes these measurement concepts, but the focus shifts to more complex measurement problems that involve volume or surface area or that require students to combine shapes and to translate and apply measures. Eighth-grade students also solve problems involving proportional thinking (such as scale drawing or map reading) and do applications that involve the use of complex measurement formulas.
Geometry and Spatial Sense	This content area is designed to extend beyond low-level identification of geometric shapes to include transformations and combinations of those shapes. Informal constructions and demonstrations (including drawing representations) along with their justifications take precedence over more traditional types of compass-and-straightedge constructions and proofs. At grade 4, students are asked to model properties of shapes under simple combinations and transformations, and to use mathematical communication skills to draw figures from verbal descriptions. At grade 8, students are asked to expand their understanding to include properties of angles and polygons. They are also asked to apply reasoning skills to make and validate conjectures about transformations and combinations of shapes.

Data Analysis, Statistics, and Probability

This content area emphasizes the appropriate methods for gathering data, the visual exploration of data, various ways of representing data, and the development and evaluation of arguments based on data analysis. At grade 4, students are asked to apply their understanding of numbers and quantities by solving problems that involve data. Fourth-graders are asked to interact with a variety of graphs, to make predictions from data and explain their reasoning, to deal informally with measures of central tendency, and to use the basic concepts of chance in meaningful contexts. At grade 8, students are asked to analyze statistical claims and to design experiments, and they are asked to use simulations to model real-world situations. This content area focuses on eighth-graders' basic understanding of sampling, their ability to make predictions based on experiments or data, and their ability to use some formal terminology related to probability, data analysis, and statistics.

Algebra and Functions

This content area extends from work with simple patterns at grade 4 to basic algebra concepts at grade 8. The grade 4 assessment involves informal demonstration of students' abilities to generalize from patterns, including the justification of their generalizations. Students are expected to translate between mathematical representations, to use simple equations, and to do basic graphing. At grade 8, the assessment includes more algebraic notation, stressing the meaning of variables and an informal understanding of the use of symbolic representations in problem-solving contexts. Students are asked to use variables to represent a rule underlying a pattern. Eighth-graders are asked to demonstrate a beginning understanding of equations and functions and the ability to solve simple equations and inequalities.

Distribution of Items

The assessment framework specifies not only the particular areas that should be assessed, but also the percentage of the assessment questions that should be devoted to each of the content area strands. The target percentage distribution for content strands as specified in the framework, along with the actual percentage distribution in the assessment, are presented in the following tables. The distribution of items among the content strands is a critical feature of the assessment design, since it reflects the relative importance and value given to each. The target percentages at eighth grade differ from those at fourth grade because of a shift in curricular emphasis. For example, in grade 4 there is more emphasis on number sense, properties, and operations than on algebra and functions. In grade 8, the percentage of algebra and functions items increases, and the percentage of number sense, properties, and operations items decreases. The actual content of the assessment is close to the targeted distribution.

Target percentage distribution of items, by content area strand and grade: 1990–2003

	Grade 4		Grade 8	
	1990–1992	1996–2003	1990–1992	1996–2003
Number sense, properties, and operations	45	40	30	25
Measurement	20	20	15	15
Geometry and spatial sense	15	15	20	20
Data analysis, statistics, and probability	10	10	15	15
Algebra and functions	10	15	20	25

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1990, 1992, 1996, 2000, and 2003 Mathematics Assessments.

1. National Council of Teachers of Mathematics. (1989). *Curriculum and Evaluation Standards for School Mathematics*. Reston, VA: Author.
2. National Assessment of Educational Progress. (1988). *Mathematics Objectives: 1990 Assessment*. Princeton, NJ: Author.
3. National Assessment Governing Board. *Mathematics Framework for the 1996 National Assessment of Educational Progress*. Washington, DC: Author.

Where to Find More Information

The NAEP Mathematics Assessment

The latest news about the NAEP 2003 mathematics assessment and the national results can be found on the NAEP web site at <http://nces.ed.gov/nationsreportcard/mathematics/results/>. The individual snapshot reports for each participating state and other jurisdictions are also available in the state results section of the web site at <http://nces.ed.gov/nationsreportcard/states/>. *The Nation's Report Card: Mathematics Highlights 2003* may be ordered or downloaded from the NAEP web site. *The Nation's Report Card: Mathematics 2003* will be available at the NAEP web site in 2004. *The Mathematics Framework for the 2003 National Assessment of Educational Progress*, on which this assessment is based, is available at the Internet address <http://www.nagb.org/pubs/>.

Additional Results from the Mathematics Assessment

For more findings from the 2003 mathematics assessments, refer to the NAEP 2003 results at <http://nces.ed.gov/nationsreportcard/naepdata/>. The interactive database at this site includes student and school variables for all participating states and other jurisdictions, the nation, and the four regions. Data tables are also available for each jurisdiction, with all background questions cross-tabulated with the major demographic variables.

More information, including this report and press releases, are available for the 2003 NAEP assessments at the Rhode Island Department of Education website: www.ridoe.net. Information on other NAEP assessments that Rhode Island participated in is also available at that address.

Technical Documentation

For explanations of NAEP survey procedures see Allen, N. L., Donoghue, J. R., and Schoeps, T. L. (2001). *The NAEP 1998 Technical Report*. (NCES 2001-509). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics. Technical information may also be found on the NAEP web site (<http://nces.ed.gov/nationsreportcard/mathematics/results2003/interpret-results.asp>).