

Part IV. Student Achievement and Gaps

This section describes student achievement patterns over time, statewide and within various student subgroups. We begin with a statewide summary of performance on the MCAS. Then, because of the high-stakes nature of the MCAS for the Class of 2003, we analyze the MCAS performance dynamics of this class before moving on to the earlier grades. Achievement gaps between different student subgroups are also explored. The section concludes with a summary of Massachusetts student performance on a variety of national assessments.

1. How are Massachusetts students performing on the MCAS?⁴²

(Note: Because the 2002 results became available during the editing of this report (Fall 2002), we have included them at the beginning of this chapter. Later portions of this chapter use previously-available data, as indicated.)

In Spring 2002, over 500,000 Massachusetts students participated in the fifth administration of the MCAS, in grades 3, 4, 5, 6, 7, 8, and 10. Statewide results for nine MCAS tests are summarized in Table 4.1 below. Three other tests—Science and Technology/Engineering in grades 5 and 8 and History and Social Science in grade 5—were also administered in 2002 on a pilot basis.

MCAS results in 2002 in every subject area are higher than they were in 1998, when the tests were first administered. The greatest gains between 1998 and 2002 have been in grade 10, where the percentage of 10th-grade students scoring in the Failure category has decreased from 28% to 14% in English Language Arts and from 52% to 25% in Mathematics. In 2002, the tests on which the lowest percentage of students received Warning/Failing scores in 2002 were Grade 3 Reading (6%), Grade 4 English Language Arts (10%), Grade 7 English Language Arts (9%), and Grade 10 English Language Arts (14%). The tests on which the highest percentage of students received Warning/Failing⁴³ scores were Grade 6 Mathematics (30%), Grade 8 Mathematics (33%), and Grade 8 History and Social Science (42%).

It is also important to look beyond the Warning/Failure rate and consider the percentage of students scoring in the Advanced and Proficient categories. Over the past five years, the percentage of 10th-grade students in these desirable categories has increased from 38% to 59% in English Language Arts and from 24% to 44% in Mathematics. Math scores at the lower grade levels have shown less progress (e.g., from 31% to 34% Advanced or Proficient in 8th-grade Mathematics), and Grade 8 History/Social Sciences scores have been quite low (11 or 12% Advanced or Proficient for the past four years). In 2002, the test on which the highest percentage of students received

⁴² For more information, see *Spring 2002 MCAS Tests: Summary of State Results* (MA Department of Education, August 2002).

⁴³ Scaled scores below 220 are categorized as “Warning” for grades 3 through 8 and “Failure” for grade 10.

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Advanced or Proficient scores were Grade 3 Reading (67%), Grade 4 English Language Arts (54%), Grade 7 English Language Arts (64%), and Grade 10 English Language Arts (59%).

TABLE 4.1: 1998-2002 STATEWIDE MCAS RESULTS, GRADES 3-10
Percentage of Students at Each Performance Level⁴⁴

	Advanced	Proficient	Needs Improvement	Warning
Grade 3 Reading				
2002	Not used	67	27	6
2001	Not used	62	31	7
Grade 4 English Language Arts				
2002	8	46	37	10
2001	7	44	38	11
2000	6	43	35	16
Grade 4 Mathematics				
2002	12	27	42	19
2001	10	24	46	19
2000	12	28	42	18
1999	12	24	44	19
1998	11	23	44	23
Grade 6 Mathematics				
2002	13	28	29	30
2001	13	23	30	33
Grade 7 English Language Arts				
2002	9	55	28	9
2001	6	49	32	12
Grade 8 Mathematics				
2002	11	23	33	33
2001	11	23	34	31
2000	10	24	27	39
1999	6	22	31	40
1998	8	23	26	42
Grade 8 History & Soc. Science				
2002	1	11	46	42
2001	1	10	48	41
2000	1	10	45	45
1999	1	10	40	49

⁴⁴ Percentages may not total 100 due to rounding. For the purpose of computing school, district, and state results, students who were absent from any subject area MCAS test without a medically-documented excuse were assigned the minimum scaled score of 200 and a performance level of Warning/Failure for that subject area. These results include regular education students, students with disabilities, and limited English proficient students.

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	Advanced	Proficient	Needs Improvement	Failure
Grade 10 English Lang. Arts				
2002	19	40	27	14
2001	15	36	31	18
2000	7	29	30	34
1999	4	30	34	32
1998	5	33	34	28
Grade 10 Mathematics				
2002	20	24	31	25
2001	18	27	30	25
2000	15	18	22	45
1999	9	15	23	53
1998	7	17	24	52

As Table 4.1 indicates, failure rates were lower on the high-stakes 2001 test than in previous years, and this performance level continued in 2002. Between 2000 and 2001, failure rates dropped from 34% to 18% in English language arts and from 45% to 25% in mathematics. The 2001 MCAS was the first high-stakes MCAS test taken by the Class of 2003; in prior years students were not required to earn a competency determination to receive a high school diploma.

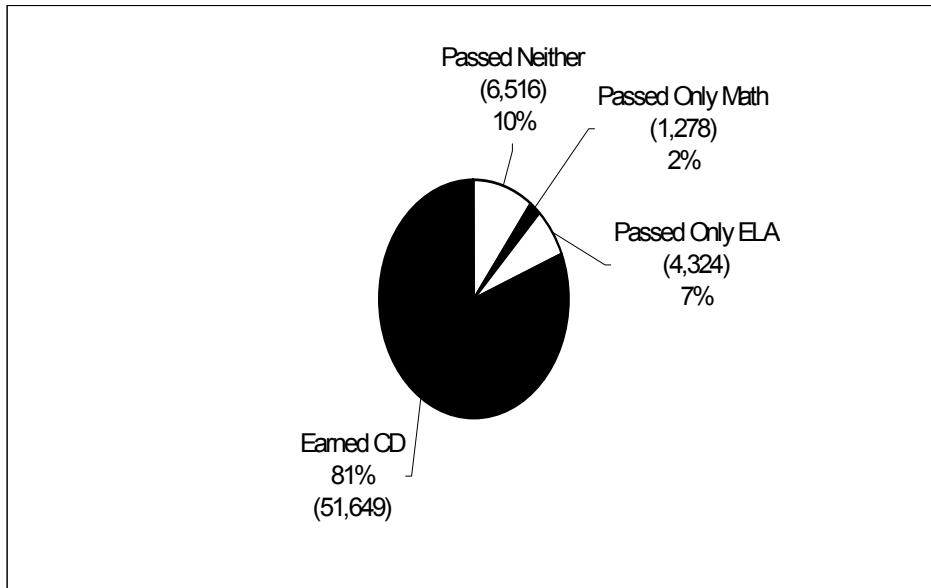
2. To what degree is the Class of 2003 meeting Massachusetts’ standards?

The Class of 2003 is the first group of high-school students for whom passing the MCAS in English language arts and mathematics is a graduation requirement. Each student has five opportunities to earn a competency determination, which entails passing both the English language Arts and Mathematics portions of the MCAS.

Class of 2003 Competency Determination Status

68% of the Class of 2003 achieved competency determination status by passing both portions of the 10th-grade MCAS in Spring 2001. Students failing either or both portions were eligible to take the focused re-test, which was first offered in the fall of 2001, or the full test in the spring of 2002. The failure rates mentioned above mean that approximately 16,000 students who had failed the English language arts portion and approximately 19,000 students who had failed the mathematics portion were eligible for the focused re-test. Approximately 75% of the Class of 2003 had achieved competency determination status after the Fall 2001 re-test and about 81% had earned a competency determination after the Spring 2002 test.

FIGURE 4.1: MASSACHUSETTS STUDENTS’ COMPETENCY DETERMINATION STATUS AFTER THE FALL 2001 AND SPRING 2002 RE-TESTS



Certificates of Mastery

In addition to achievement of a minimum competency level by all students, MERA also called for Certificates of Advanced Mastery (CAMs) to recognize exemplary achievement by students at levels comparable to advanced students in other countries. Criteria for the Stanley Z. Koplík Certificate of Mastery Awards were approved by the Board of Education in 2000. As noted earlier, 860 students from 183 schools received CAMs in 2000, and an additional 1,859 students from 214 schools did so in 2001. The Department of Education calculates that, based on their MCAS performance, more than 21,500 juniors and seniors were eligible to apply for the 2002 award.

The table below shows the distribution of CAM recipients across different district types.

TABLE 4.2: STANLEY Z. KOPLIK CERTIFICATE OF MASTERY AWARDS 2000 AND 2001, BY DISTRICT CATEGORY

District Income Category	2000		2001	
	# of Students Awarded CAM's	# of Schools	# of Students Awarded CAM's	# of Schools
Highest	353	47	755	50
High	271	55	510	60
Middle	134	41	319	51
Low	63	27	151	30
Lowest	34	10	107	15
Charters	5	3	14	5
Other (private, home school)	-	-	3	3

3. What kinds of achievement gaps exist?

MCAS performance varies across different sub-populations. On a diagnostic level, this can be seen as MCAS fulfilling its mandate to spotlight achievement disparities and thereby direct energy and resources to the neediest students and schools. Because of the high-stakes nature of the assessment, however, these disparities also mean that the negative consequences of failure will fall more heavily on certain populations if the gaps are not closed.

Competency determination rates by subgroup

The “bottom line” for the Class of 2003 is the number of students passing both the English language arts and mathematics portions of the 10th-grade MCAS. The following table shows the impact of the first (Fall 2001) and second (Spring 2002) re-tests on student passing rates.

TABLE 4.3: COMPETENCY DETERMINATION RESULTS FOR THE CLASS OF 2003 AFTER THE FALL 2001 AND SPRING 2002 RE-TESTS

All Students and Selected Subgroups ⁴⁵					
	Original Class of 2003			Current Class of 2003	
	Spring 2001 Enrollment	Percentage Who Have Earned a CD Spring 2001 + Fall 2001 Re-test		Fall 2001 Enrollment	% Who Have Earned a CD as of Spring 2002 Re-test
All Students	68,118	68%	75%	63,767	81%
Student Status					
Limited English Proficient (LEP)	2,190	7%	18%	2,335	35%
Students with Disabilities	9,434	30%	42%	7,806	55%
Regular Education	56,494	77%	83%	53,626	87%
Race/Ethnicity					
African-American/Black	4,076	37%	47%	5,074	56%
Asian	2,750	68%	76%	2,956	83%
Hispanic	5,055	29%	38%	5,284	50%
Native American	141	48%	57%	172	83%
White	47,498	77%	83%	50,281	87%
Gender					
Female	32,932	72%	78%	31,917	83%
Male	33,479	66%	73%	31,850	80%

⁴⁵ Derived from the Massachusetts Department of Education *Progress Report on the Class of 2003* (September 2002).

Vocational Technical High Schools

In addition to the gender, student status, and race and ethnicity subgroups, vocational technical school students as a group stand apart from the state averages.⁴⁶ After the first Spring 2001 administration only 46% of students from the Class of 2003 attending technical vocational schools earned a competency determination.⁴⁷ This percentage was up from the Spring 2000 MCAS results, in which only 20% of students passed both the English language arts and mathematics tests and after the Spring 2001 MCAS 46% of vocational student met the competency determination requirement according to the DOE.

Vocational students were not pulled out as a separate category in subsequent DOE reports on the Class of 2003. Because regional vocational technical high schools are considered single districts, we are able to provide estimates on the progress of vocational technical students from these schools. After the first administration of the MCAS approximately 45% of vocational students received a competency determination. After the Fall 2001 and Spring 2002 re-tests approximately 70% of regional vocational technical students enrolled in the 11th grade received a competency determination. Between the Fall 2001 and Fall 2002 there were 562 fewer regional vocational students in the Class of 2003 (there were 6,333 total vocational students in these regional vocational districts in Fall 2001).⁴⁸

⁴⁶ Because our unit of analysis is at the district level, it is difficult to capture all of the vocational technical schools that are single schools within a larger district. For the purposes of this analysis we use the regional technical vocational and agricultural schools that are considered separate districts.

⁴⁷ From the Massachusetts Department of Education *2001 MCAS Results* retrieved from the Mass DOE website.

⁴⁸ Data Source: Massachusetts Department of Education *Progress of the Class of 2003* (September 2002) "District Results" retrieved on September 24, 2002 from www.doe.mass.edu.

Achievement gaps by income (district level)

Based on the district income categories used earlier in this report, districts with higher numbers of free/reduced lunch students have higher MCAS failure rates on the Fall 2001 and Spring 2002 10th-grade MCAS re-tests. After the Spring 2002 re-test, approximately 95% of the students in the highest income districts had received a competency determination, while in the lowest income districts about 59% of the Class of 2003 had earned a competency determination.

FIGURE 4.2: PERCENT OF STUDENTS WITHIN THE CLASS OF 2003 EARNING A COMPETENCY DETERMINATION VIA MCAS AND RE-TESTS, BY DISTRICT INCOME CATEGORY

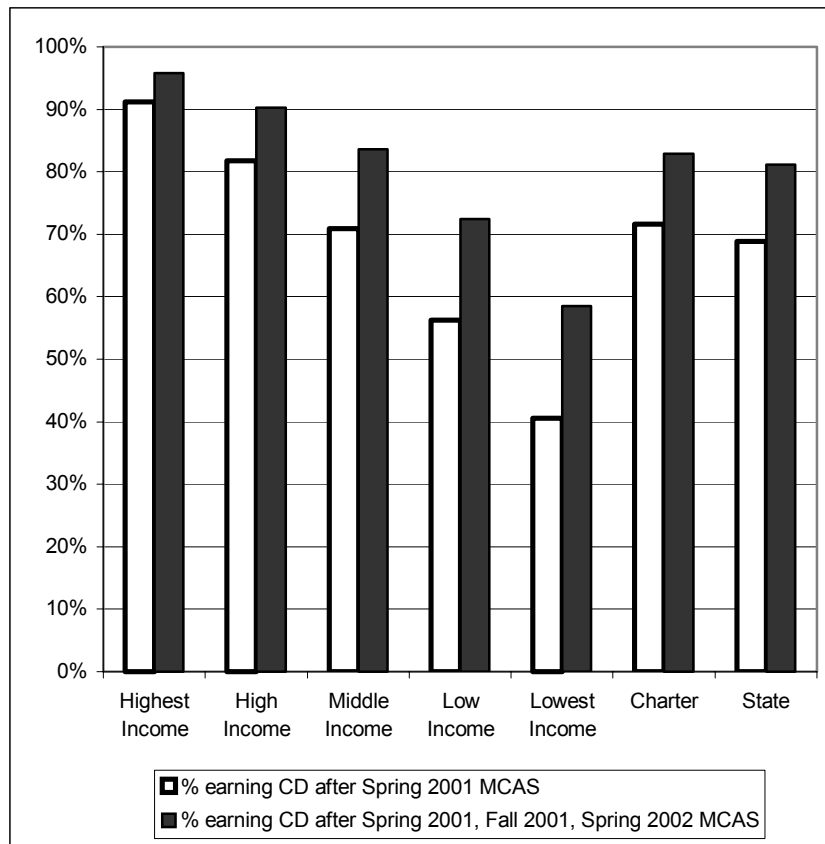


TABLE 4.4 & 4.5: SPRING 2001 10TH-GRADE MCAS PERFORMANCE, BY DISTRICT INCOME CATEGORY

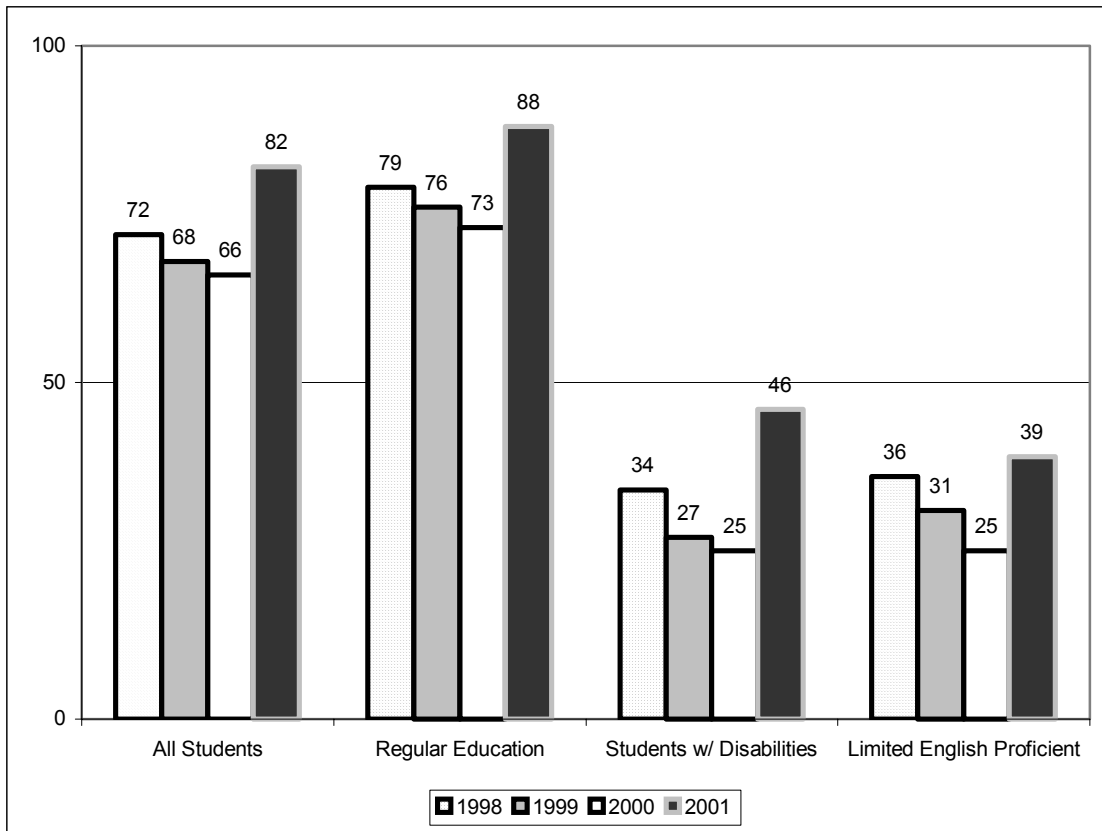
ENGLISH LANGUAGE ARTS Percentage of 10 th -Grade Students within MCAS Achievement Levels					
District Income Category	Advanced	Proficient	Needs Improvement	Warning/ Failing	Failing - Absent
Highest Income	30%	46%	19%	4%	0%
High Income	20%	42%	28%	9%	0%
Middle Income	12%	36%	36%	15%	1%
Low Income	8%	29%	37%	25%	1%
Lowest Income	6%	21%	33%	36%	4%

MATHEMATICS Percentage of 10 th -Grade Students within MCAS Achievement Levels					
District Income Category	Advanced	Proficient	Needs Improvement	Warning/ Failing	Failing - Absent
Highest Income	37%	35%	22%	7%	0%
High Income	23%	32%	31%	14%	0%
Middle Income	14%	28%	35%	22%	1%
Low Income	9%	21%	35%	34%	1%
Lowest Income	8%	15%	28%	45%	4%

Achievement gaps by student status

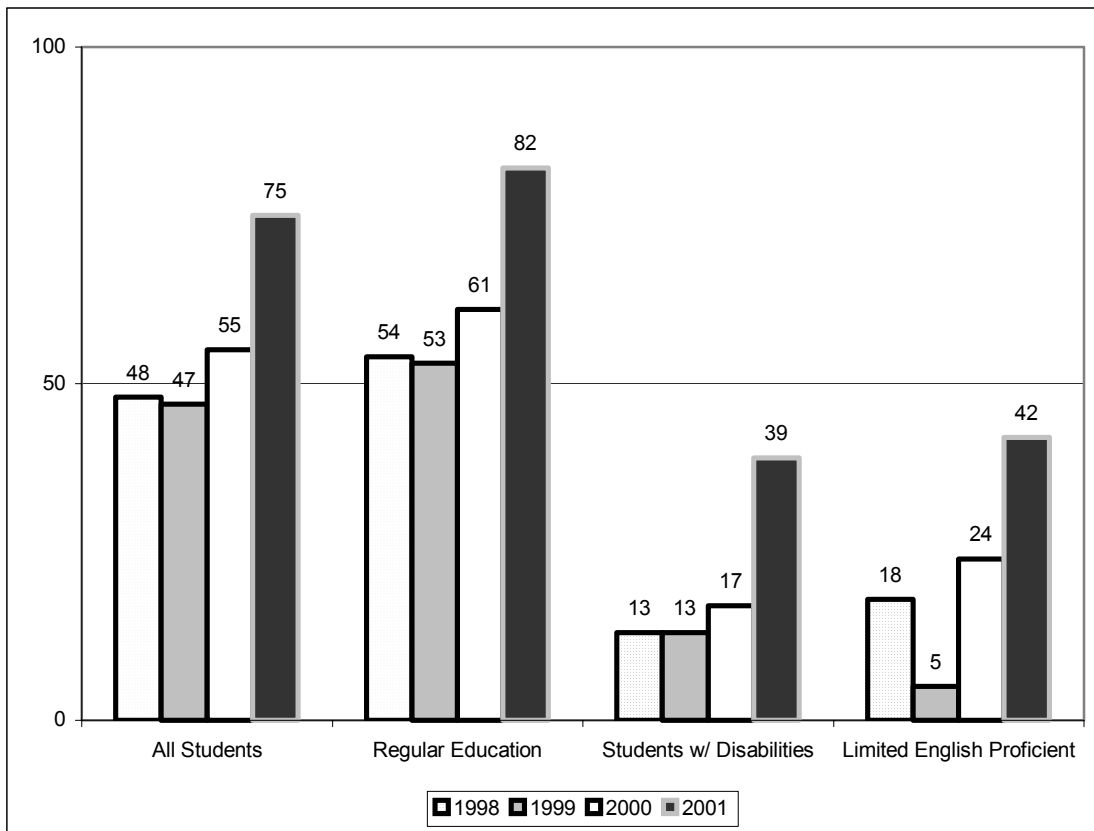
Overall, 18% of all 10th-graders failed the English language arts assessment and 25% failed the mathematics assessment in Fall 2001. Failure rates for “regular education” students were significantly lower—12% and 18% respectively. Conversely, failure rates for students with disabilities⁴⁹ and participating Limited English Proficient students were much higher than the average, with more failing each section than passing it.

FIGURE 4.3: PERCENTAGE OF 10TH-GRADERS PASSING ELA MCAS, BY STUDENT STATUS, 1998-2001



⁴⁹ Students with disabilities are defined as students who “either have an Instructional Education Program (IEP) or receive Section 504 instructional accommodations” (http://www.doe.mass.edu/mcas/gen_req.html)

FIGURE 4.4: PERCENTAGE OF 10TH-GRADERS PASSING MATH MCAS, BY STUDENT STATUS, 1998-2001



Achievement gaps by race/ethnicity

As the chart below indicates, African-American and Hispanic 10th-graders were significantly less likely to pass the MCAS assessments than their White and Asian counterparts.

FIGURE 4.5: PERCENTAGE OF 10TH-GRADERS PASSING ELA MCAS, BY RACE/ETHNICITY, 1998-2001

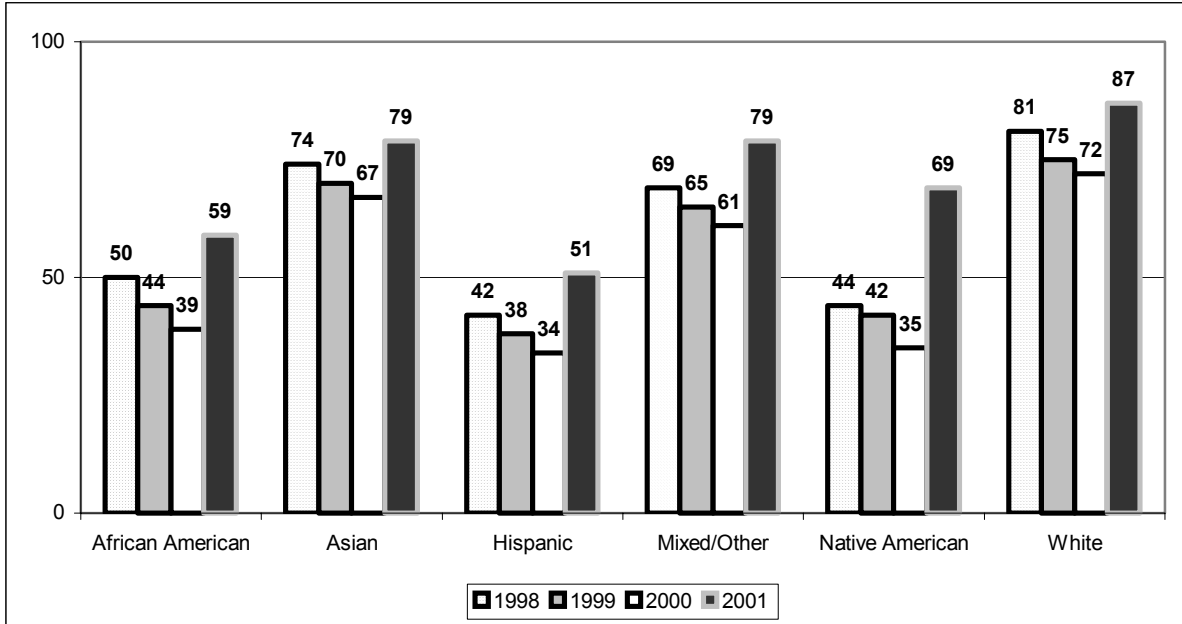
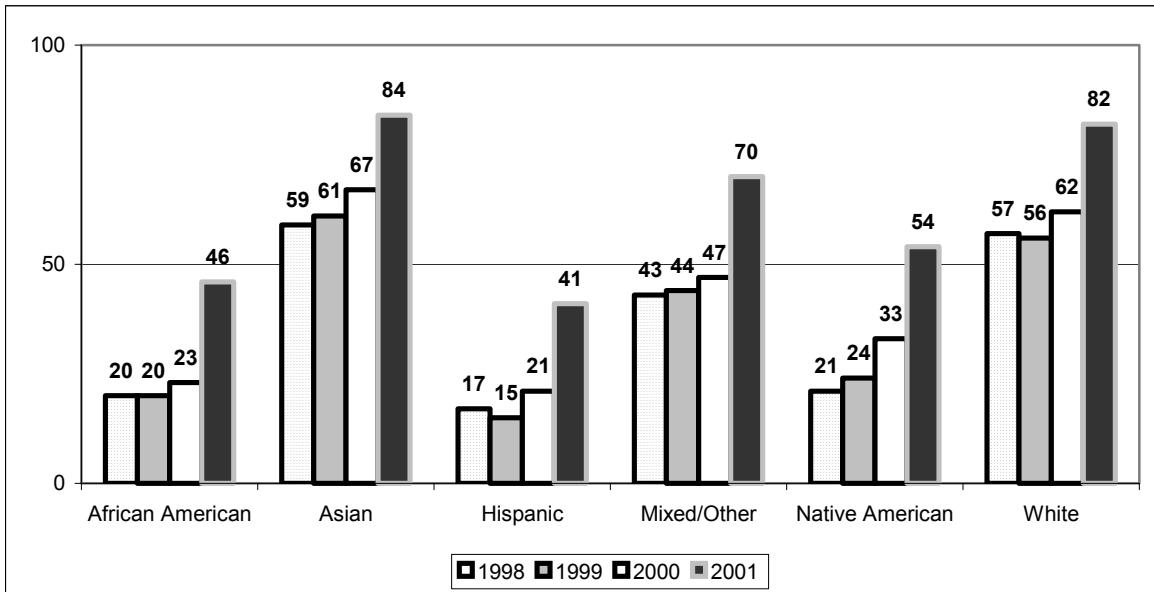


FIGURE 4.6: PERCENTAGE OF 10TH-GRADERS PASSING MATH MCAS BY RACE/ETHNICITY, 1998-2001



How close are failing students to passing the MCAS?

Data on the performance across scaled score intervals were not available for the Spring 2002 re-test; therefore the following information is limited to that available for the Fall 2001 re-test. As the following graphics indicate, of students taking the Fall 2001 focused re-test, 31% passed the mathematics assessment and 48% passed the English language arts assessment. Another one-third were within four points of the 220 passing score on each of the tests.

FIGURE 4.7: FALL 2001 MCAS ENGLISH LANGUAGE ARTS RE-TEST PERFORMANCE ACROSS SCALED SCORE INTERVALS, BY STUDENT STATUS

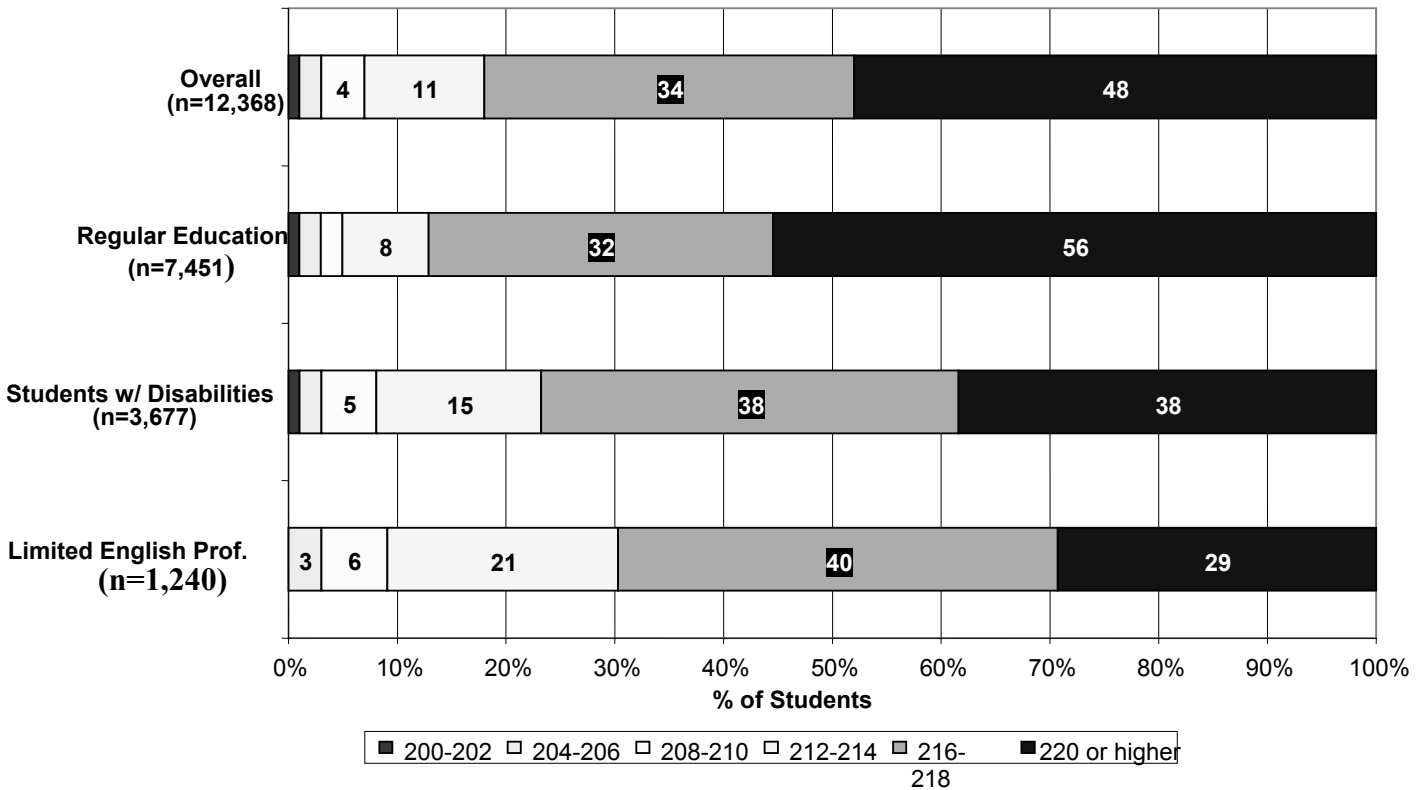


FIGURE 4.8: FALL 2001 MCAS ENGLISH LANGUAGE ARTS RE-TEST PERFORMANCE ACROSS SCALED SCORE INTERVALS, BY RACE/ETHNICITY

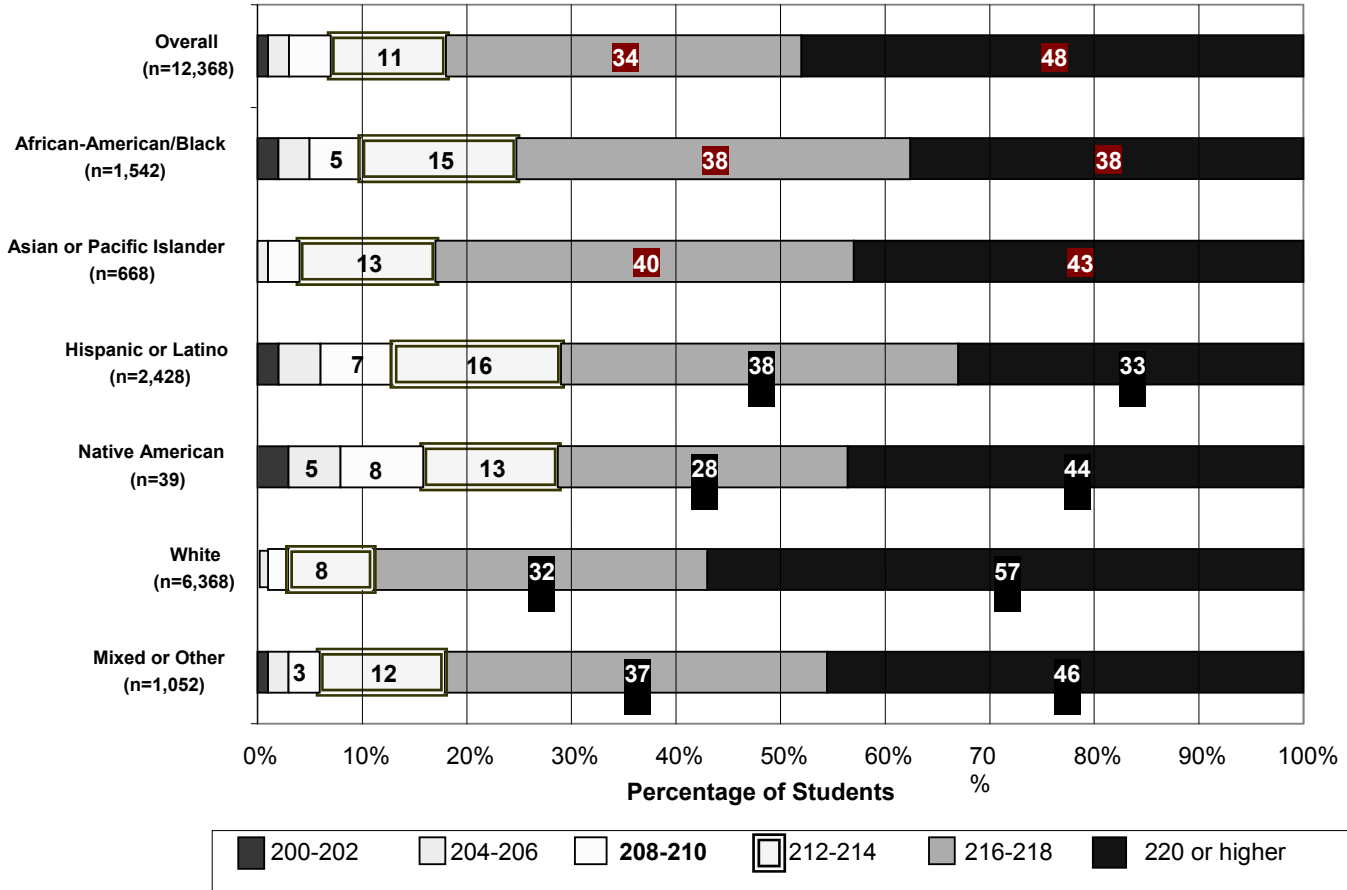


FIGURE 4.9: FALL 2001 MATHEMATICS RE-TEST PERFORMANCE ACROSS SCALED SCORE INTERVALS, BY STUDENT STATUS

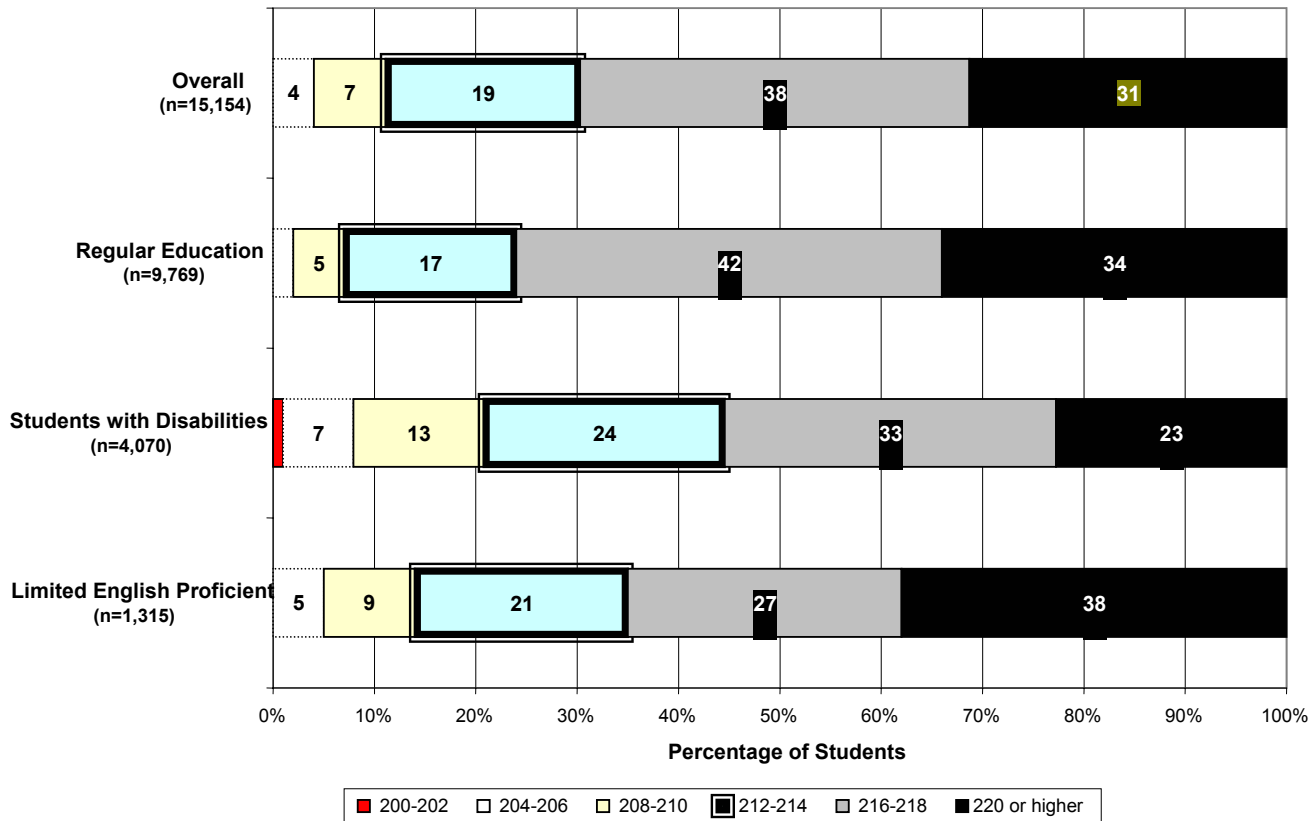
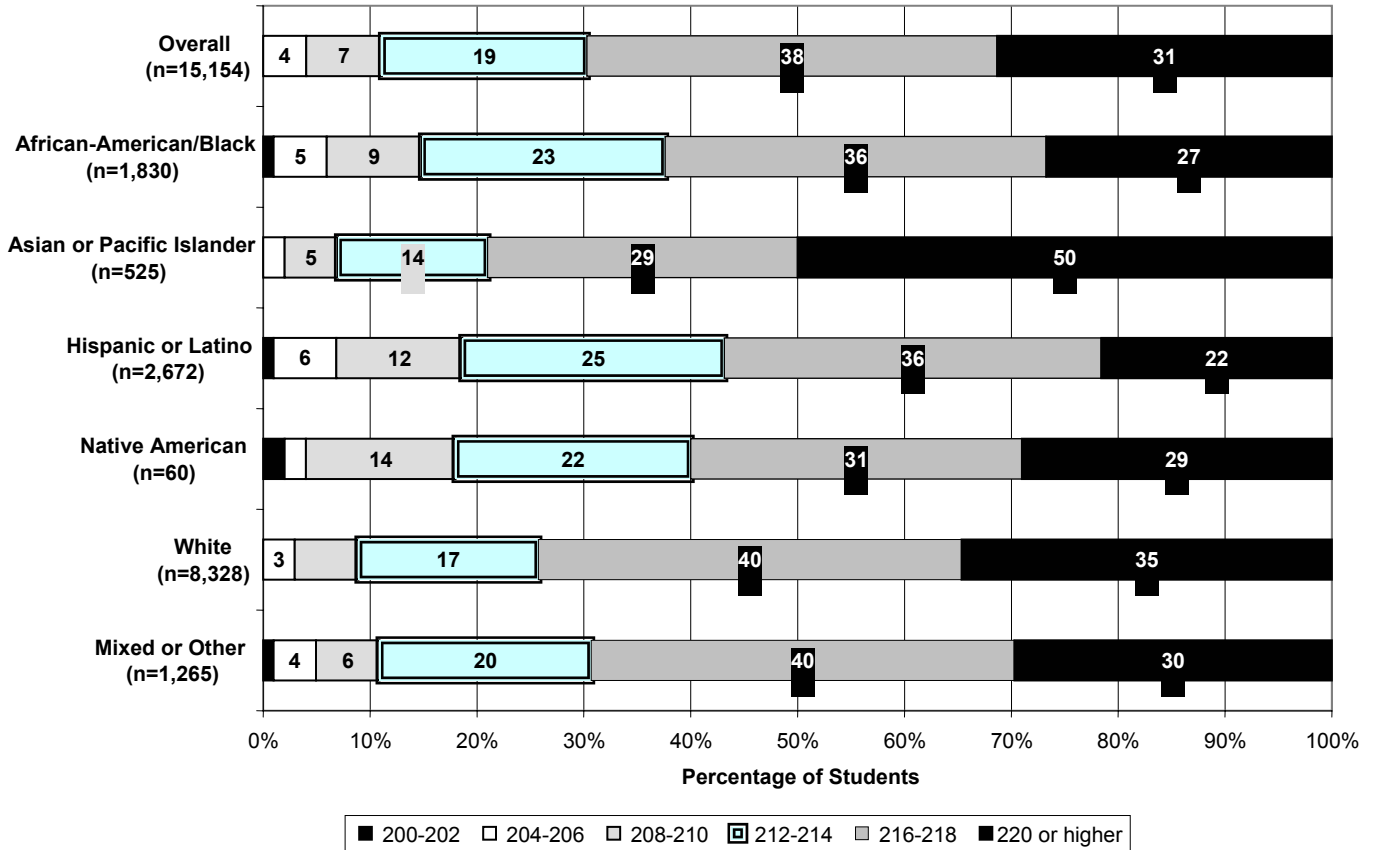


FIGURE 4.10: FALL 2001 MCAS MATHEMATICS RE-TEST PERFORMANCE ACROSS SCALED SCORE INTERVALS, BY RACE/ETHNICITY



4. How are younger students performing on the MCAS?

Spring 2001 MCAS scores

On average, younger students performed fairly well on the 2001 MCAS in Reading and English language arts, with 93% passing the 3rd-grade reading test and between 87% and 92% passing the 4th, 7th, and 8th-grade English language arts tests. Math was more problematic—while 80% passed the 4th-grade test, only 66-68% passed the 6th and 8th-grade tests. The history/social science average score was even lower, with 59% passing. (See table 4.6.)

Achievement gaps by income (district level)

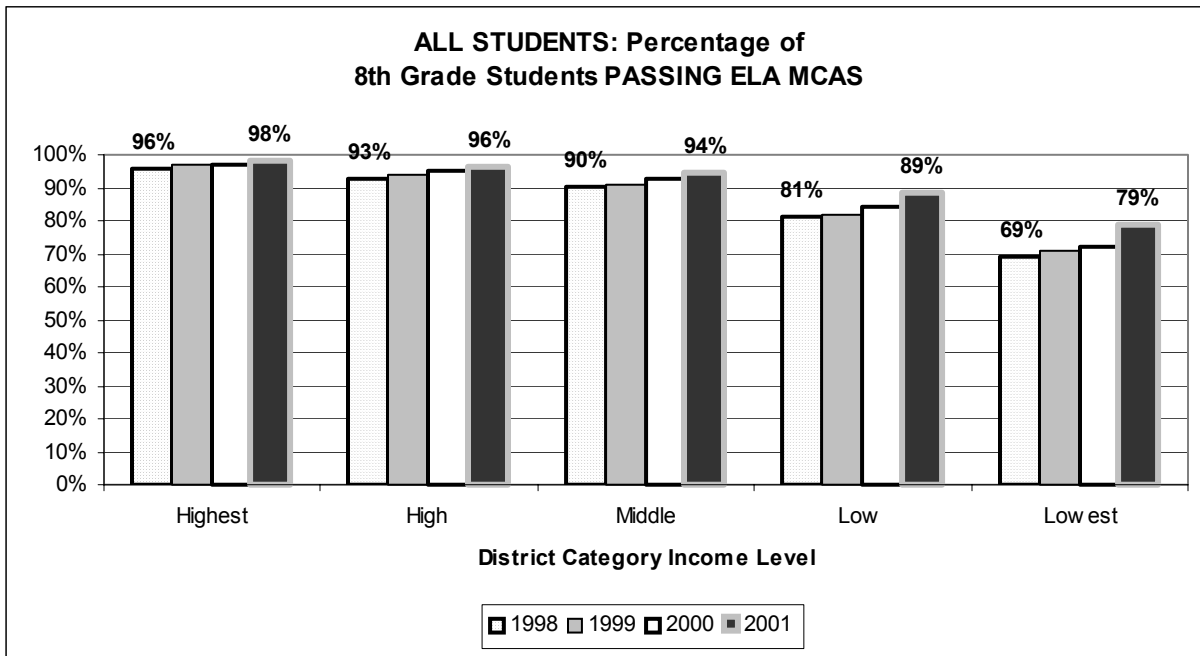
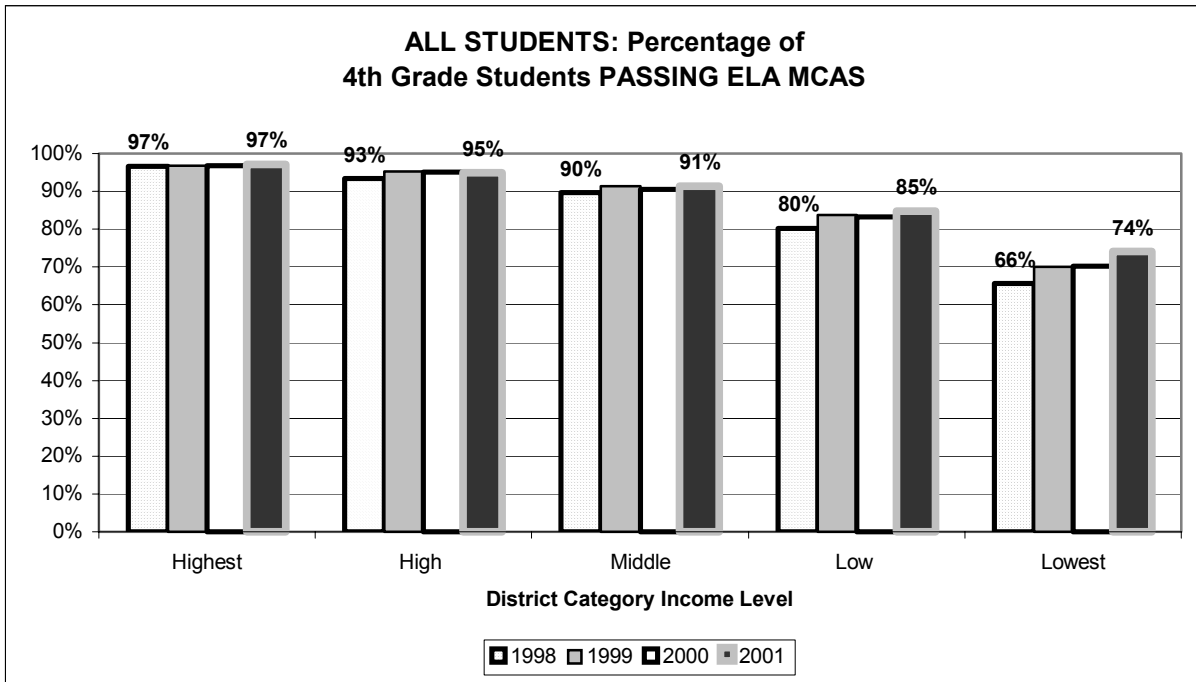
As with the 10th-graders, average results were higher in the higher-income districts and lower in the lower-income categories. In 3rd-grade reading, however, all but the lowest-income students averaged over 90% passing, as did 85% of the lowest-income. In English language arts, average passing rates ranged from 97% to 74% for 4th-graders, 97% to 71% for 7th-graders, and 98% to 79% for 8th-graders. In mathematics, the performance varied more widely, from 94% to 62% for 4th-graders, 83% to 39% for 6th-graders, and 89% to 41% for 8th-graders. Across grades 4 through 8, the average gap between highest and lowest income categories was 27.7 percentage points in English language arts and 41.3 percentage points in mathematics. History/social science average passing rates ranged from 82% in the highest-income districts to 32% in the lowest-income districts.

TABLE 4.6: 2001 MCAS PASSING RATES, BY DISTRICT INCOME CATEGORY

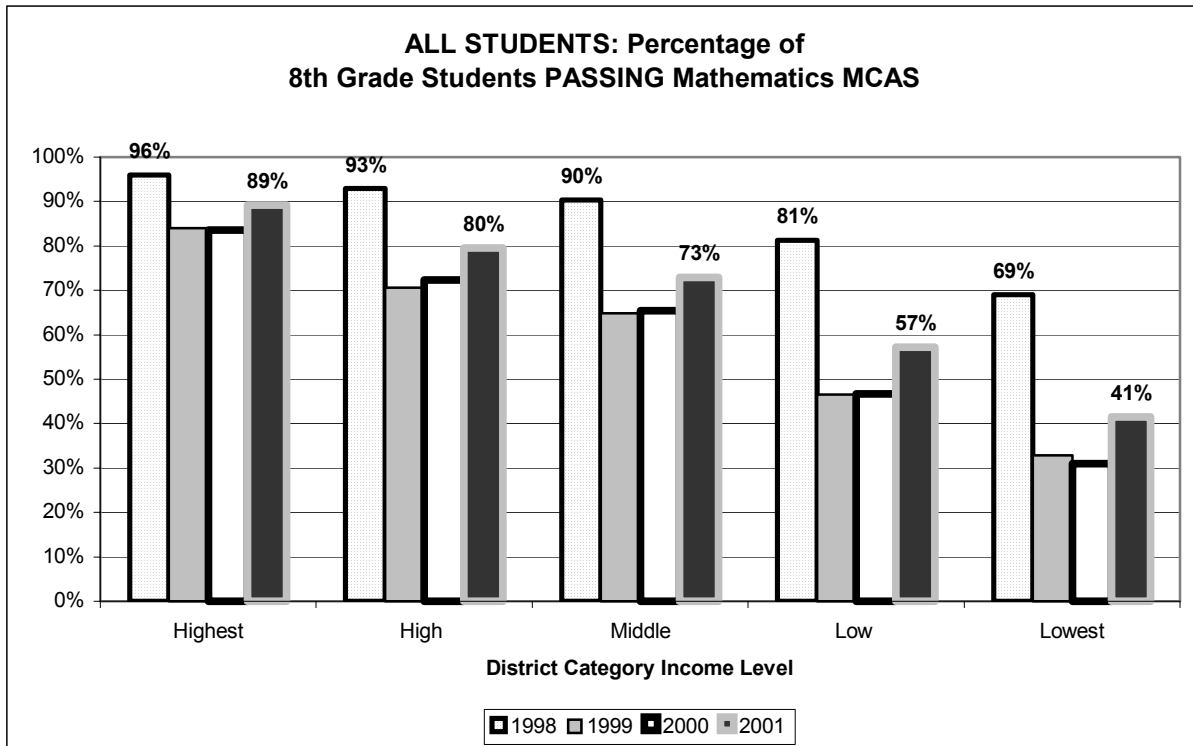
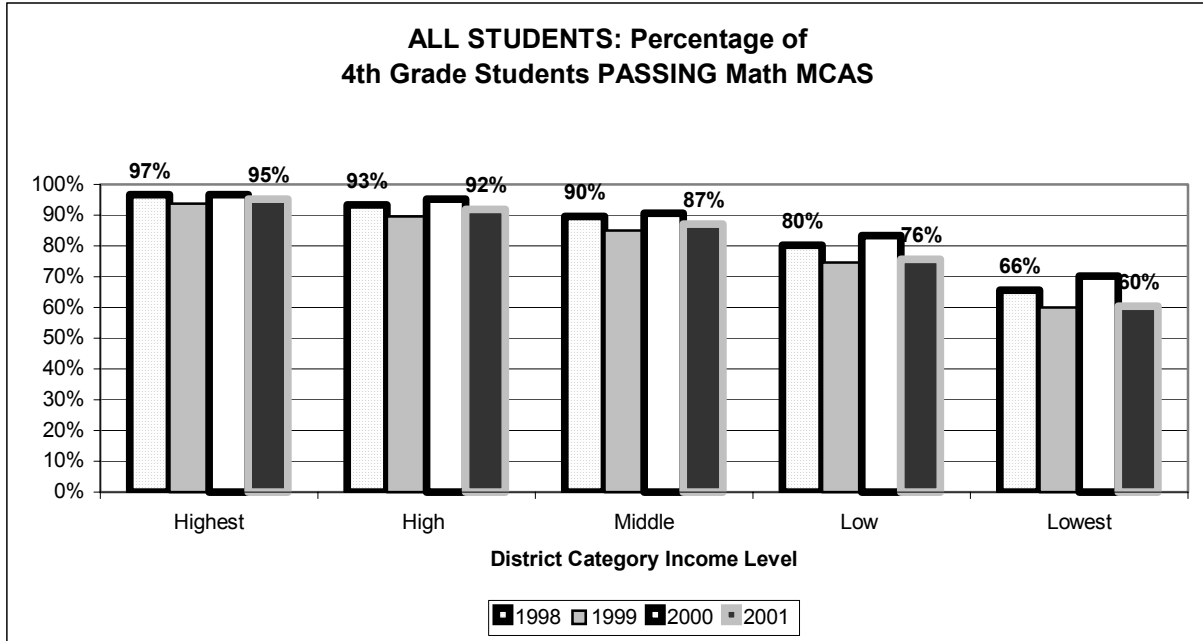
	All Students	Students by District Income Category				
		Highest	High	Middle	Low	Lowest
Grade 3						
Reading	93	98	97	95	92	83
Grade 4						
ELA	89	97	95	91	85	74
Math	80	94	90	85	74	62
Grade 6						
Math	66	83	78	68	55	39
Grade 7						
ELA	87	97	94	91	83	71
Grade 8						
ELA	92	98	96	94	89	79
Math	68	89	80	73	57	41
Hist/Soc	59	82	71	62	47	32

FIGURES 4.11 & 4.12: PERCENTAGE OF 4TH & 8TH-GRADERS PASSING ENGLISH LANGUAGE ARTS MCAS, BY DISTRICT INCOME CATEGORY, 1998-2001

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FIGURES 4.13 & 4.14: PERCENTAGE OF 4TH & 8TH-GRADERS PASSING MATHEMATICS MCAS, BY DISTRICT INCOME CATEGORY, 1998-2001



Achievement gaps by student status

On average, regular education students did well on the MCAS in Reading and English language arts, with 93% or more passing the 3rd, 4th, 7th, and 8th-grade tests. LEP students performed significantly worse in mathematics than in English language arts (48% versus 57% passing in 4th grade and 29% versus 65% passing in 8th grade). Both students with disabilities and LEP students passed the MCAS at significantly lower levels than regular education students. 6th and 8th-grade math and 8th-grade history/social science were particularly problematic, with 31% or fewer students with disabilities and LEP students passing (these were also the worst performance areas for regular education students, but two-thirds to three-quarters of these students passed.) (See table below.)

Achievement gaps by race/ethnicity

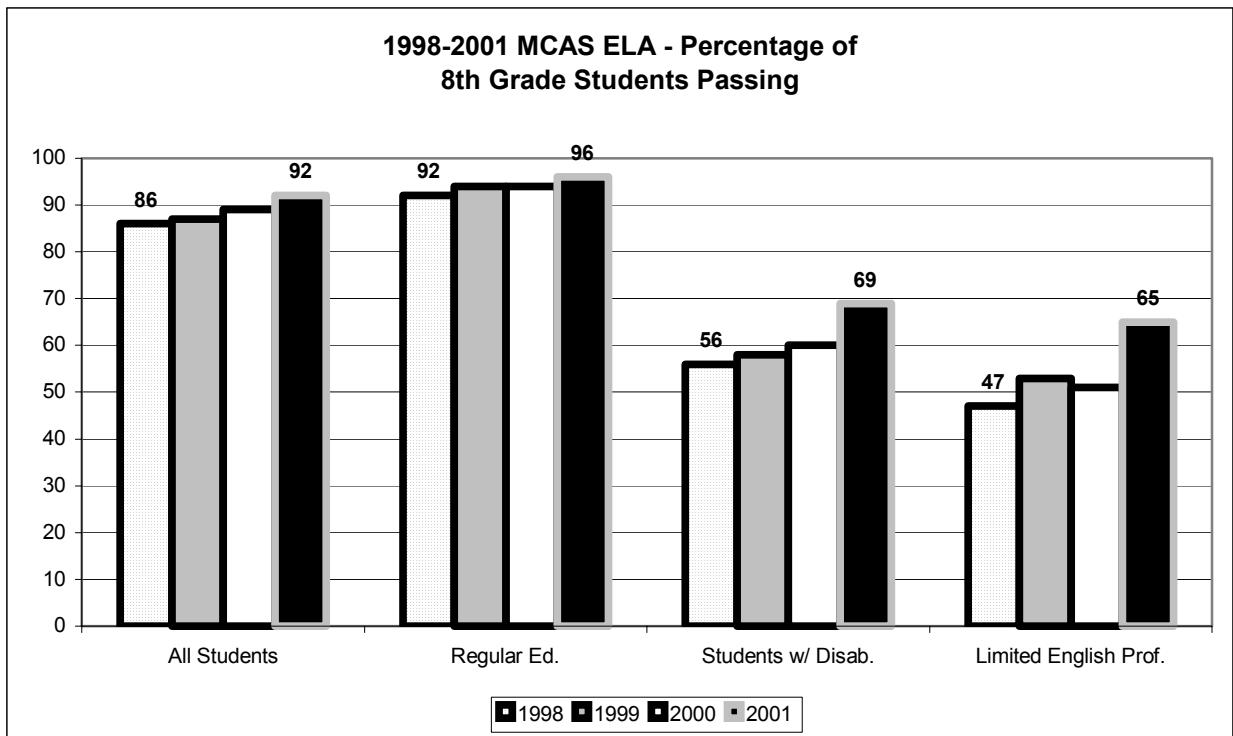
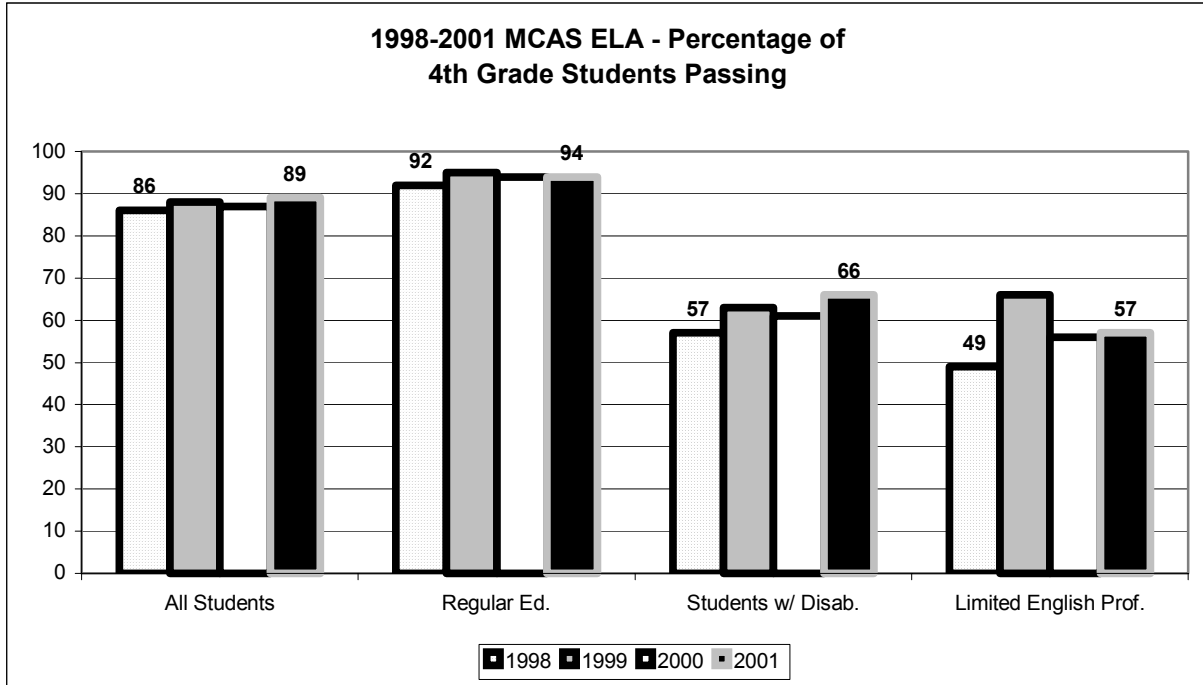
Passing rates varied by race/ethnicity, with white and Asian students on average having higher passing rates than African-American, hispanic/latino, and native American students. Four-fifths or more of all groups passed the 3rd-grade reading test. 6th and 8th-grade math was particularly problematic, on average, for African-American and hispanic/latino students, with only about one-third of these students passing, versus three-quarters of white and asian students.

TABLE 4.7: 2001 MCAS PASSING RATES, BY GRADE AND STUDENT SUB-GROUP

	<i>All</i>	<i>Student Status</i>			<i>Race/Ethnicity</i>					
		Reg. Ed	Stud. w/ Disab	LEP	Af. Am/ Black	Asian	Hisp./ Latino	Native Am	White	Mixed Other
Grade 3										
Reading	93	97	78	73	84	91	79	91	96	94
Grade 4										
ELA	89	94	66	57	75	86	68	76	93	87
Math	80	87	57	48	58	84	56	67	89	77
Grade 6										
Math	66	74	31	19	34	73	31	48	75	61
Grade 7										
ELA	87	93	62	51	72	88	66	69	93	86
Grade 8										
ELA	92	96	69	65	79	92	75	79	95	92
Math	68	77	30	29	38	75	34	51	76	65
Hist/Soc	59	66	26	16	30	60	22	46	67	55

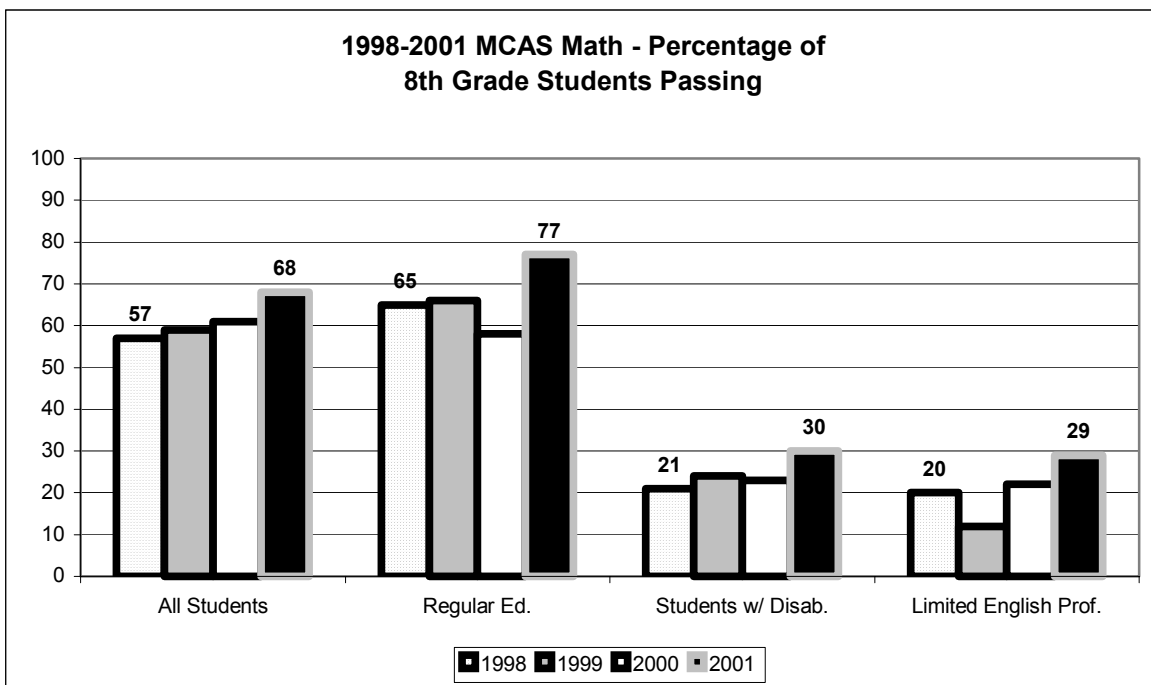
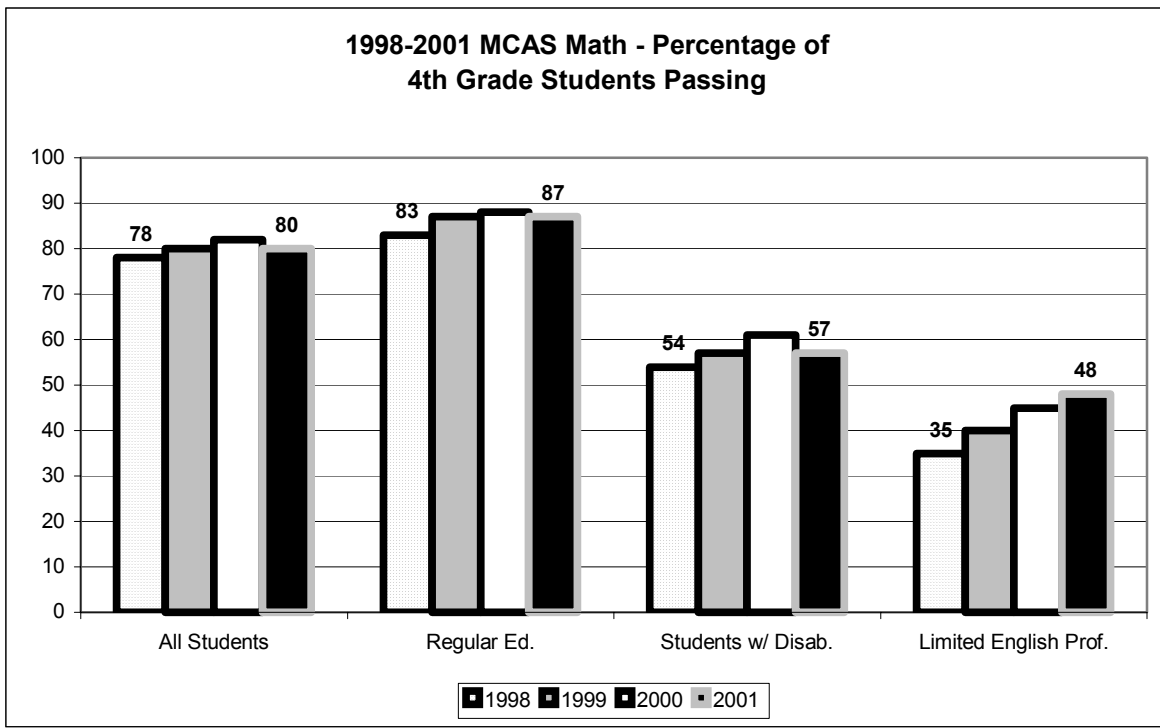
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FIGURES 4.15 & 4.16: PERCENTAGE OF 4TH & 8TH-GRADERS PASSING ENGLISH LANGUAGE ARTS MCAS, BY STUDENT STATUS, 1998-2001

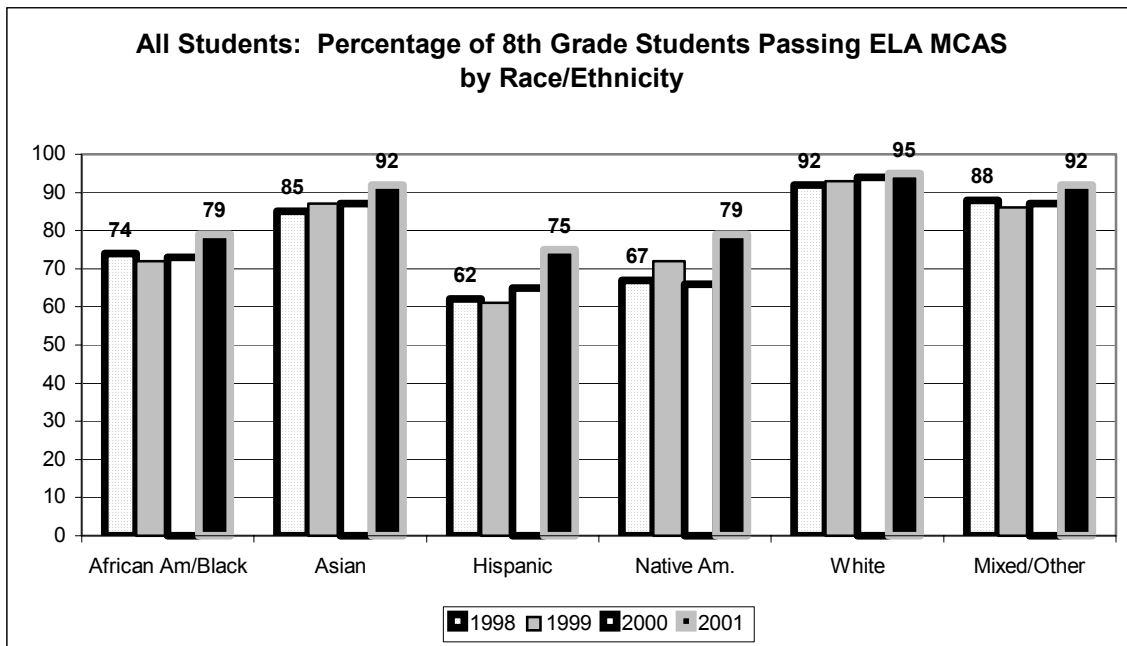
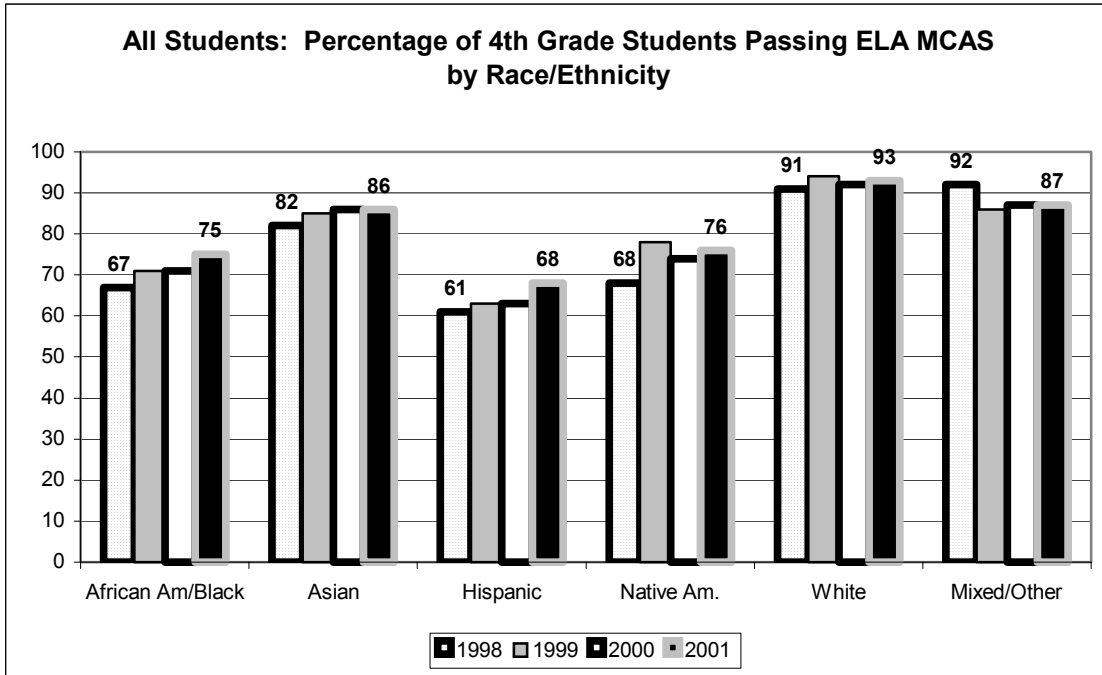


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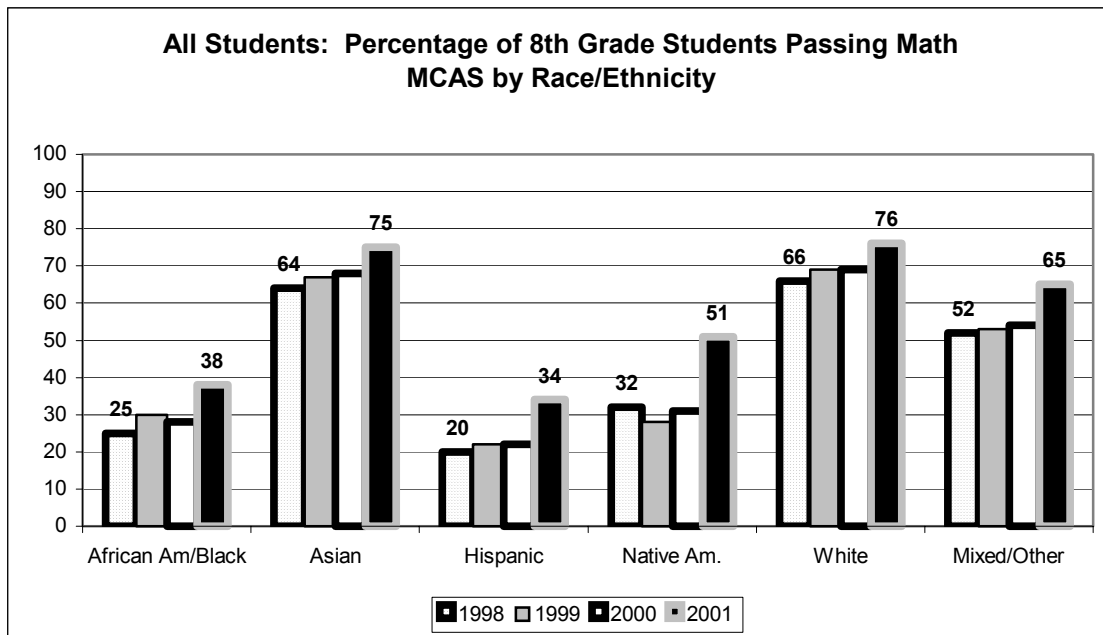
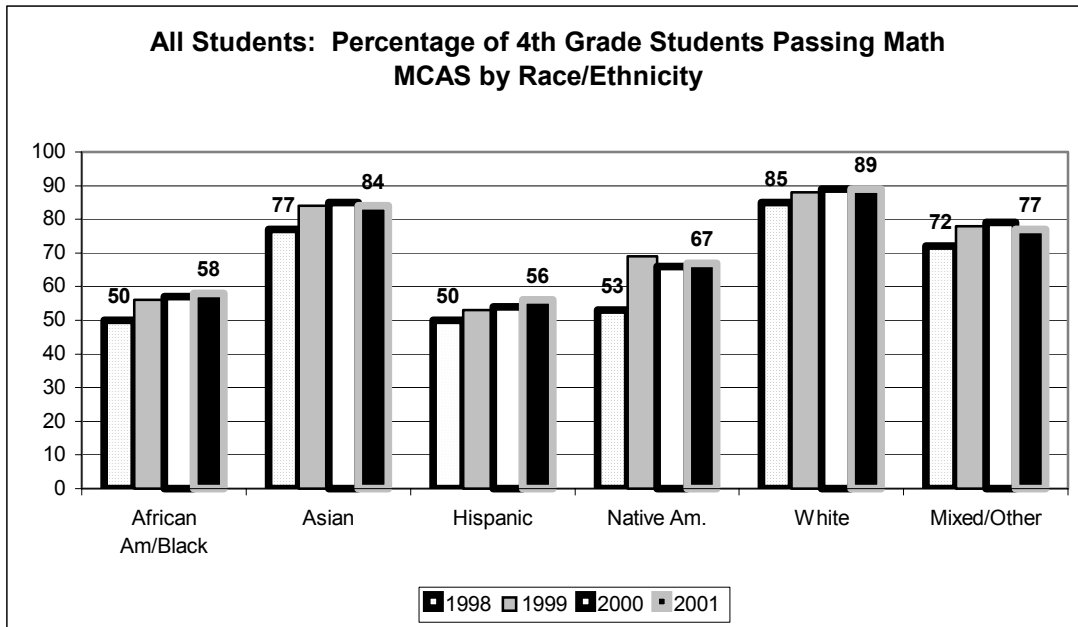
FIGURES 4.17 & 4.18: PERCENTAGE OF 4TH & 8TH-GRADERS PASSING MATHEMATICS MCAS, BY STUDENT STATUS, 1998-2001



FIGURES 4.19 & 4.20: PERCENTAGE OF 4TH & 8TH-GRADERS PASSING ENGLISH LANGUAGE ARTS MCAS, BY RACE & ETHNICITY, 1998-2001



FIGURES 4.21 & 4.22: PERCENTAGE OF 4TH & 8TH-GRADERS PASSING MATHEMATICS MCAS, BY RACE & ETHNICITY, 1998-2001



5. How do Massachusetts students compare with those elsewhere?

While Massachusetts students still have a way to go to meet Massachusetts' standards, they actually outperform many of their peers on other, external measures.

The National Assessment of Educational Progress (NAEP)

The NAEP is a national assessment used to track what America's students know and can do in various subject areas. Students in grades 4 and 8 are scored across four achievement levels: advanced, proficient, basic, and below basic on a scoring scale of 0 to 500. Achievement levels are determined by the National Assessment Governing Board, and it is estimated that ten points in the scaled score represents one grade level.⁵⁰ Students are sampled on a national basis for the national NAEP results, and states may also choose to participate on a statewide basis, using a sample tailored for tracking state-level progress. Massachusetts participates in both the national and state-level NAEP, allowing for comparisons to be made between the Commonwealth and participating states.

⁵¹

On the 2000 Mathematics NAEP, Massachusetts 4th-graders ranked third and 8th-graders were tied for fifth among their peers in participating states. Since 1992, the Commonwealth's percentage of student scoring at or above "Basic" on the NAEP mathematics test has increased by about ten percentage points among 4th-graders and 13 points among 8th-graders.

NAEP scores in reading and writing have also improved in most areas (with the exception of 4th-grade reading, in which the percentage scoring at or above "Basic" decreased by one percentage point, from 74% to 73%, between 1992 and 1998). On the most recent NAEP reading assessments administered in 1998, Massachusetts 4th-graders ranked fifth and eighth-graders ranked fourth. On the 1998 NAEP writing assessment, Massachusetts 8th-graders ranked second after their counterparts in Connecticut.⁵²

The Education Trust is an organization that monitors states across the nation with particular focus on student achievement gaps. In their series entitled, *Ed Watch Online* they examine achievement gaps in student NAEP scores, as well as disparities in areas such as course offerings, teacher quality and school finance. In 2001 Ed Trust highlighted the following areas in the "State Summary of Massachusetts."

⁵⁰ Education Trust, "What is NAEP" retrieved August 2002 from http://204.176.179.36/dc/edtrust/navfiles/faq_display.html#18.

⁵¹ According to Education Week Quality Counts 2002, forty states participated or had enough students participating to constitute an appropriate samples size for the state in the 4th and 8th grade mathematics test in 2000, slightly fewer states (39 and 38) participated in the 4th and 8th grade science NAEP. Forty states participated in the 1998 4th grade reading NAEP and about 36 participated in the 8th grade reading and writing NAEP administered in that same year.

⁵² NAEP data is from the Education Trust website "Ed Watch Data" retrieved in August 2002 from www.edtrust.org.

Part IV. STUDENT ACHIEVEMENT AND GAPS

- African American 4th-graders made more progress in math from 1992 to 1996 than African American 4th-graders in any other state.
- However, African American 8th-graders in Massachusetts score more than three years [10 points is the equivalent of one year] behind White 8th-graders in math and science; and more than 2 years behind White 8th-graders in reading.
- Latino 8th-graders in Massachusetts score about 4 years behind White 8th-graders in the state in math, more than three years behind in science and writing, and more than two years behind in reading.
- Low income 8th graders in Massachusetts score about three years behind non-poor 8th graders in the state in math, science, reading and writing.⁵³

TABLE 4.8: NAEP SCORES

Subject	Grade	Year	Scaled Scores		Achievement Level % of Students at or Above		
			MA Avg.	U.S. Avg.	Basic	Proficient	Advanced
Mathematics (scale: 0-500)	4	1992	227	219	68	23	2
		1996	229	222	71	24	2
		2000	235	226	79	33	3
	8	1992	273	267	63	23	3
		1996	278	271	68	28	5
		2000	283	274	76	32	6
Reading (scale: 0-500)	4	1992	226	215	74	36	7
		1994	223	212	69	36	8
		1998	225	215	73	37	8
	8	1998	269	261	80	36	3
Science (scale: 0-300)	4	2000	162	148	81	43	6
	8	1996	157	148	69	37	4
		2000	161	149	74	42	5
Writing (scale: 0-300)	8	1998	155	148	87	31	2

⁵³ Education Trust (2001) "Ed Watch Online: State Summary of Massachusetts" available at http://204.176.179.36/dc/edtrust/ew_pdfs/summaries_ma.pdf

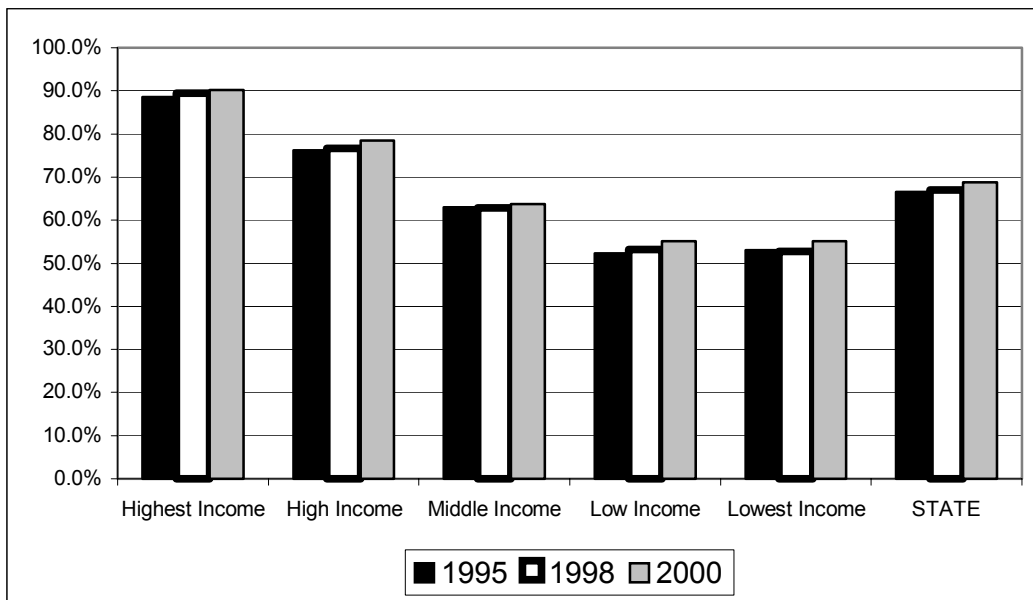
Scholastic Aptitude Test (SAT)

SAT scores can be used as an indicator for the subset of students who are planning on seeking postsecondary educational opportunities. In Massachusetts the average verbal and mathematics combined score in 2001 was 1026 out of 1600, compared with the national average of 1020.

This level of performance is particularly impressive when participation rate is factored in. Massachusetts had one of the highest participation rates in the nation. At 79% the participation rate of Massachusetts students was higher than all but two states (Connecticut, New Jersey)⁵⁴.

Within the Commonwealth, as the graphic below indicates, SAT participation rates increased in all district categories between 1995 and 2000. However, while the highest-income districts are approaching a 90% participation rate, students in the lower-income districts have a rate of approximately 55%.

FIGURE 4.23: SAT AVERAGE PARTICIPATION RATES, BY DISTRICT INCOME CATEGORY, 1995, 1998, 2000⁵⁵



⁵⁴ Massachusetts Department of Education (2001) "Massachusetts SAT scores rise again" retrieved September, 2001 http://www.doe.mass.edu/news/archive01/sat_chrt.html.

⁵⁵ District level 2001 SAT data were not available.

Third International Mathematics and Science Study (TIMSS)

The TIMSS was first administered in 1995, and subsequently in 1999. It was conducted to assess the mathematics and science achievement of students at the 8th-grade level in 38 countries around the world. In 1999, Massachusetts participated in the TIMSS Benchmarking Study, which compared the performance of U.S. students in 13 states and 14 districts/consortia to their international peers. In Massachusetts, 2,354 8th grade students in 57 schools participated.

In mathematics, Massachusetts students have a higher average overall TIMSS scores than the U.S. and international averages, scoring 513 versus the U.S. average of 502 and the international average of 487. In science, Massachusetts students also outscored their U.S. and international counterparts, averaging 533 points compared to the U.S. average of 515 and the international average of 488. Massachusetts students showed particular strength in fractions and numbers, algebra, and life sciences.

TABLE 4.9: TIMSS AVERAGE ACHIEVEMENT IN MATHEMATICS CONTENT AREAS FOR MASSACHUSETTS STUDENTS⁵⁶

Average	Overall	Fractions/ Numbers	Measure	Geometry	Algebra
Massachusetts	513	521	491	477	521
United States	502	509	482	473	506
International	487	487	487	487	487

TABLE 4.10: TIMSS AVERAGE ACHIEVEMENT IN SCIENCE CONTENT AREAS FOR MASSACHUSETTS STUDENTS

Average	Overall	Earth Science	Life Science	Physics	Chemistry
Massachusetts	533	516	531	510	522
United States	515	504	520	498	508
International	488	488	488	488	488

⁵⁶ Table 4.9 and 4.10 represent an abridged version of the content areas.

Other Indicators

Within Massachusetts, 96% of schools offered Advanced Placement courses in 2002.

Only two states, Maryland and Utah, have higher numbers of 8th graders taking Algebra 1, Algebra 2, or Geometry, according to Education Week's 2002 Quality Counts report.

