PUBLIC SCHOOLS of BROOKLINE

Spring 2015 MCAS Results:
Subgroup Report

March 2016

I. Executive Summary

For nearly twenty years, all students in grades 3-8 and 10 in Massachusetts public schools have taken the MCAS to assess their proficiency in ELA and math. Brookline students have always achieved at high rates and outperformed the state average. The Spring 2015 tests were no exception; overall, 83% of all Brookline students were proficient or advanced in ELA and 78% were proficient or advanced in math.

While Brookline students have achieved high and consistent levels of proficiency in MCAS ELA and math over the past ten years, similar to the trends statewide there are notable gaps in achievement particularly for some racial/ethnic groups, income-based groups, and students with disabilities. Similar gaps exist nationally and statewide. The Department of Elementary and Secondary Education (DESE) notes in its 2015 MCAS summary that these gaps have narrowed in Massachusetts.

II. Historical Context

Brookline 2005-2016

In the past decade, total enrollment in the Public Schools of Brookline has increased by 27%, or 1,654 students. During the same period, student demographics have shifted, with an 8% reduction in the percentage of students identifying as White (from 64% to 56%), a 3% reduction in the percentage of students identifying as Black/African-American (from 9% to 6%) and accompanying increases in the Hispanic/Latino (+3%), Multi-Racial[1] (+6%), and Asian (+2%) populations[2].

Total Enrollment in the Public Schools of Brookline, 2005-06 to 2015-16
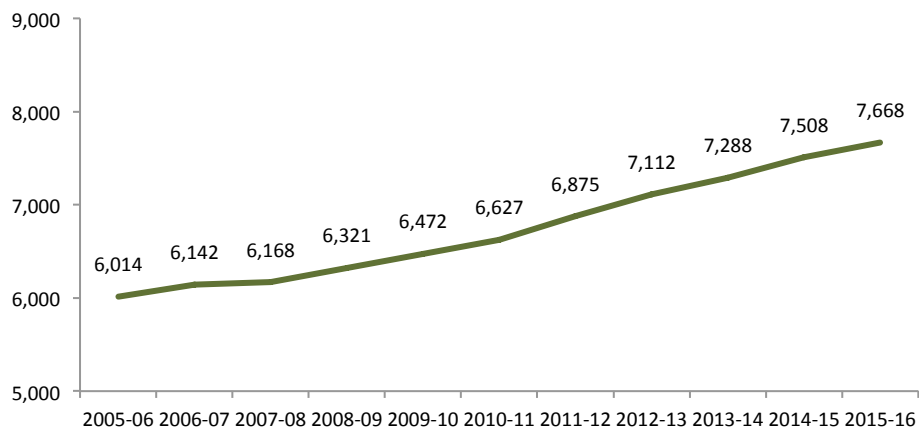
During the same time period, the student/teacher ratio has risen, from 11.5:1 to 13.0: 1. Over the last three years, however, the average class size has dropped, from 17.7 to 17.1. This remains below the state's average class size of 18 students. In 2015, class sizes ranged from 16 to 26 students in the K-8 elementary schools in Brookline.

The percentage of students of low-income status remained steady around 12% until 2014-15 when the category was changed to economically disadvantaged (see footnote, page 7). At this time, the district moved to an 8% economically disadvantaged population[3], which has held steady for two years. Since the metric was developed in 2012-13, the district's High Needs[4] population has declined somewhat, from 34% in 2012-13 to 32% in 2015-16. In the past decade,

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[1] Students are categorized into only one racial/ethnic group: Asian, Black/African-American, Hispanic/Latino, Multi-Racial, White, Native American, or Native Hawaiian. Students who identify as ethnically Hispanic/Latino will be categorized as such regardless of the racial category(ies) they select. Students who do not

[2] In 2015-16, the district's racial/ethnic breakdown is: 6% Black/African-American, 19% Asian, 10% Hispanic/Latino, 56% White, and 9% Multi-Racial.

[3] A similar decline was seen statewide when the definition transitioned from "low-income" to "economically disadvantaged". The state's percentage moved from 38% low income to 26% economically disadvantaged at that time.

[4] "High Needs" is the unduplicated population of students designated as low-income/economically disadvantaged, ELL, former ELL, and/or student with disabilities.

the percentage of English language learner students has risen from 6% to 10% of the population. During the same period, the percentage of students for whom English is not their first language has risen from 26% to 30%.

MCAS Results 2005-2015

Across the state of Massachusetts, students' MCAS proficiency rates[5] in ELA and math have remained relatively static over the last few years following a slight rise in the mid-2000s[6]. The state experienced notable rises in the proficiency rates in ELA and math in 2015, during a year when only half of the state's students took the MCAS test. Though the DESE estimated overall proficiency using a statistically representative sample of students, it's difficult to say how much of the rise was due to students' improvements in proficiency and how much was due to testing selections.

Brookline's proficiency rates, though higher than the state's average, have followed a similar pattern. The district's overall proficiency rate in ELA has been stable around 83% for eight years. The proficiency rate in math has dipped very slightly, from 80% to 78%, but has also remained relatively stable. A listing of the number of students tested in Brookline in 2015 and the number of students by subgroup can be found in Appendix C.

MCAS ELA Proficiency Rates 2005-2015, Brookline and State of Massachusetts
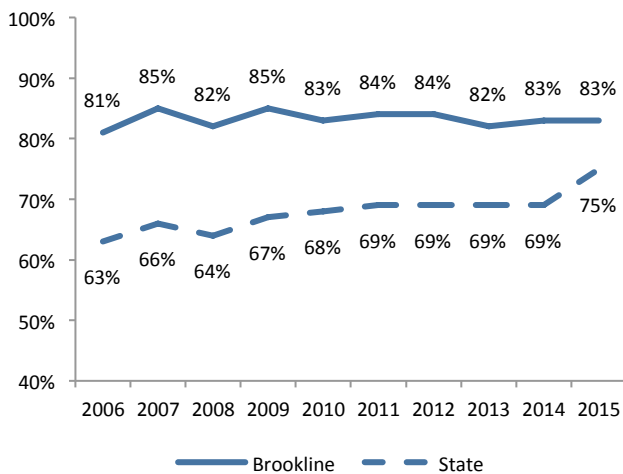
MCAS Math Proficiency Rates 2005-2015, Brookline and State of Massachusetts
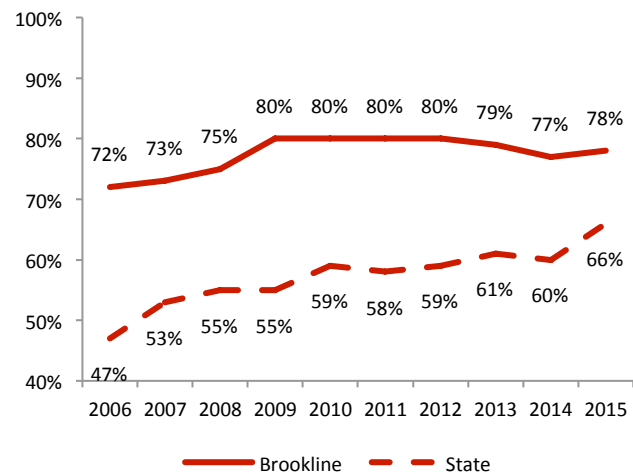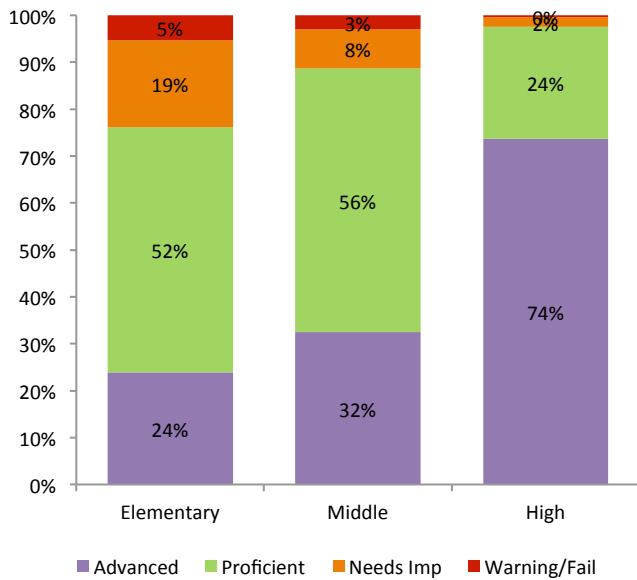

III. 2015 Overall Performance

In Spring 2015, students in Brookline achieved at high levels overall, with 84% of students achieving proficiency in ELA and 79% in math. Students in high school had the highest proficiency rates with 98% proficiency in ELA and 93% in math, followed by middle grades[7] students (88% ELA, 79% math), and elementary students (76% ELA, 75% math).

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[5] In this report, "proficiency rates" refers to the cumulative percentage of students scoring in the Proficient or Advanced categories on the referenced test.
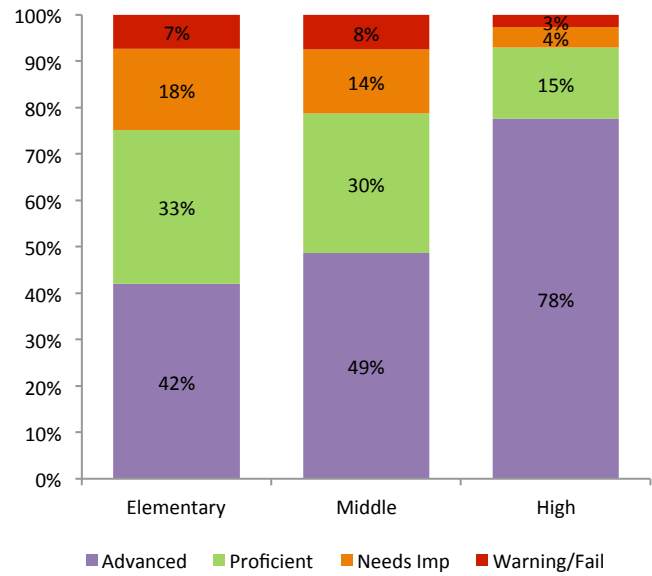
[6] In Spring 2015, districts across Massachusetts were asked to select whether their students in grades 3-8 would take the PARCC or the MCAS tests that year. Approximately half of all students in the state took the PARCC test. Because of this self-selection, the population of students taking the MCAS tests in grades 3-8 was not representative of the total population of students. To correct for this, the 2015 proficiency rates for the state have been estimated by the Department of Elementary and Secondary Education (DESE) based on a "representative sample" of roughly 74% of the students who took the MCAS test in Spring 2015. The sampling was statistically representative and results are therefore considered to be comparable to prior years.

[7] "Middle grades" refers to students in grades 6-8. "Elementary" refers to students in grades 3-5.
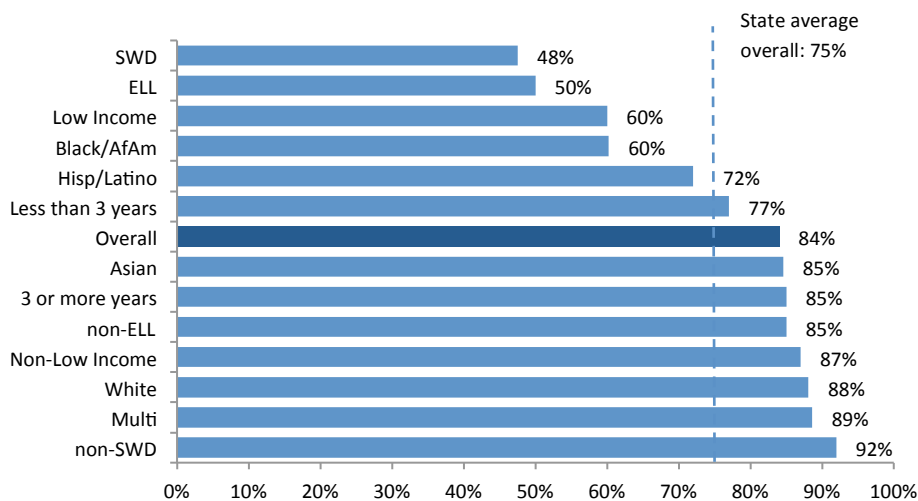
ELA Performance by Grade Level, 2015

	Advanced	Proficient	Needs Imp	Warning/Fail
Elementary	24%	52%	19%	5%
Middle	32%	56%	8%	3%
High	74%	24%	2%	0%

Math Performance by Grade Level, 2015

	Advanced	Proficient	Needs Imp	Warning/Fail
Elementary	42%	33%	18%	7%
Middle	49%	30%	14%	8%
High	78%	15%	4%	3%

Similar to the patterns seen statewide, in Brookline specific subgroups of students underperformed in both ELA and math when compared to the district average: students with disabilities, English language learners, students of low-income status, students in the district less than three years, Black/African-American students, and Hispanic/Latino students. With the exception of students in the district less than three years, these subgroups of students achieved below the overall state average[8] for proficiency in both ELA & math (Brookline's ELL students matched the state average in math).

Students without disabilities, students not of low-income status, students in the district three or more years, White students, and Asian students performed better than both the district and state averages across both subjects.

Proficiency Rates for all Key Subgroups, MCAS ELA, 2015

State average overall: 75%

Subgroup	Rate
SWD	48%
ELL	50%
Low Income	60%
Black/AfAm	60%
Hisp/Latino	72%
Less than 3 years	77%
Overall	84%
Asian	85%
3 or more years	85%
non-ELL	85%
Non-Low Income	87%
White	88%
Multi	89%
non-SWD	92%

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[8] State averages are estimated using a representative sample of students from across the state, since only a portion of students in grades 3-8 participated in MCAS ELA and math. The state average line provided here is intended to allow a comparison of all Brookline subgroup performance against the state's overall performance. It is not a direct comparison of subgroups in Brookline to subgroups statewide and should only be used to understand how each subgroup compares to the state average overall. For example, in Brookline, students in the district less than three years performed below the district average but above the state average in ELA.

Proficiency Rates for all Key Subgroups, MCAS Math, 2015
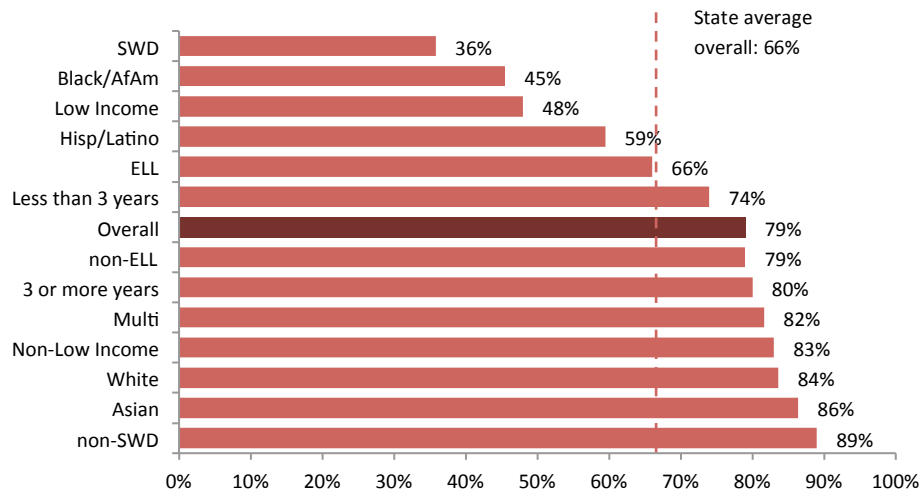
Overall, students in the district maintained high student growth percentiles (SGP)[9] of 59 in both ELA and math. This SGP indicates that Brookline students improved as much as or more than 59% of their academic peers statewide in both subjects[10]. A listing of all SGPs in Brookline by subgroup can be found in Appendix B (page 16).

IV. Achievement Gaps

Race/Ethnicity

Brookline's race-based achievement gaps between Black/African-American, Hispanic/Latino, and White students have been narrowing since 2006, however the rate of the gap closing has been slower than what has occurred statewide. In one case – Black/African-American students in ELA – the gap has increased by one percentage point since 2006.

Proficiency Rate Gap Changes from 2006 to 2015 Between White, Black/African-American, and Hispanic/Latino Students, Brookline and the State of Massachusetts[11]

	ELA		Math	
	Brookline	**State**	**Brookline**	**State**
Black/African American	Gap increased 1% point from 26 to 27	Gap decreased 13% points from 30 to 17	Gap decreased 3% points from 42 to 39	Gap decreased 7% points from 31 to 24
Hispanic/Latino	Gap decreased 9% points from 25 to 16	Gap decreased 9% points from 36 to 27	Gap decreased 6% points from 30 to 24	Gap decreased 4% points from 32 to 28

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[9] The Student Growth Percentile (SGP) is a measure of student progress that compares changes in a student's MCAS scores to changes in MCAS scores of other students with similar scores in prior years ("academic peers"). More information about the SGP can be found at http://www.doe.mass.edu/mcas/growth/InterpretiveGuide.pdf.

[10] The DESE states that roughly 65% of student groups will have a median SGP somewhere between 40 and 60. Medians above 60 or below 40 are unusual and indicate particularly high or low rates of growth.

[11] Numbers in this chart represent the difference between proficiency rates for White students and proficiency rates for the subgroups listed. The numbers do not represent the actual proficiency rates for each group.

During the same time period of 2006 to 2015, proficiency rates rose for nearly all groups, both in Brookline and statewide:

Proficiency Rates for White, Black/African-American, and Hispanic/Latino Students, 2006 and 2015, Brookline and the State of Massachusetts

	ELA				Math			
	Brookline		State		Brookline		State	
	2006	2015	2006	2015	2006	2015	2006	2015
White	87%	88%	70%	81%	78%	84%	53%	72%
Black/African-American	61%	61%	40%	64%	36%	45%	22%	48%
Hispanic/Latino	62%	72%	34%	54%	48%	60%	21%	44%

In Brookline, regardless of the racial/ethnic subgroup, nearly 50% of all students scored in the Proficient category on the ELA MCAS.

Thirty-six percent of Asian, 37% of Multi-Racial, and 37% of White students scored in the Advanced category in ELA, compared to 23% of Hispanic/Latino students and 13% of Black/African-American students. Similarly, while 15% of Asian, 11% of Multi-Racial, and 12% of White students were below proficient in ELA, 40% of Black/African-American and 28% of Hispanic/Latino students scored below proficient.

In math, 63% of Asian and 52% of Multi-Racial and White students scored in the Advanced category, as compared to 16% of Black/African-American and 31% of Hispanic/Latino students. Fourteen percent of Asian, 18% of Multi-Racial, and 17% of White students scored in the Warning/Fail category. Twenty-six percent of Black/African-American and 15% of Hispanic/Latino students scored in this category.

ELA Performance by Race/Ethnicity, 2015
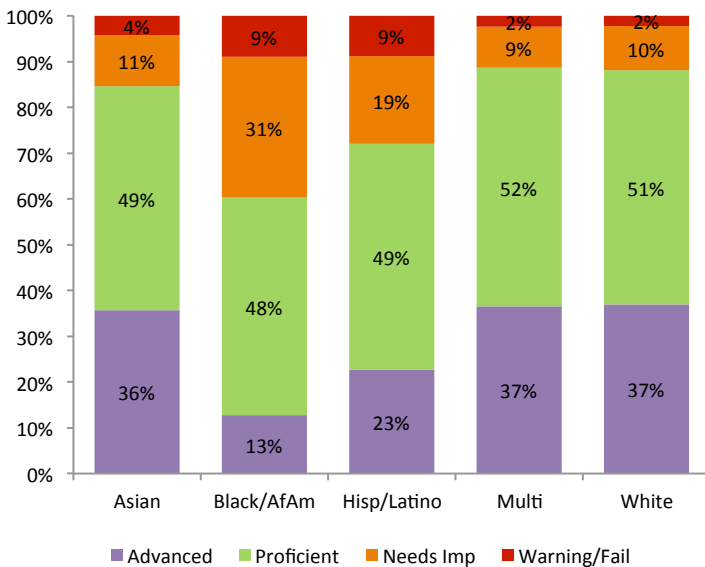
Math Performance by Race/Ethnicity, 2015
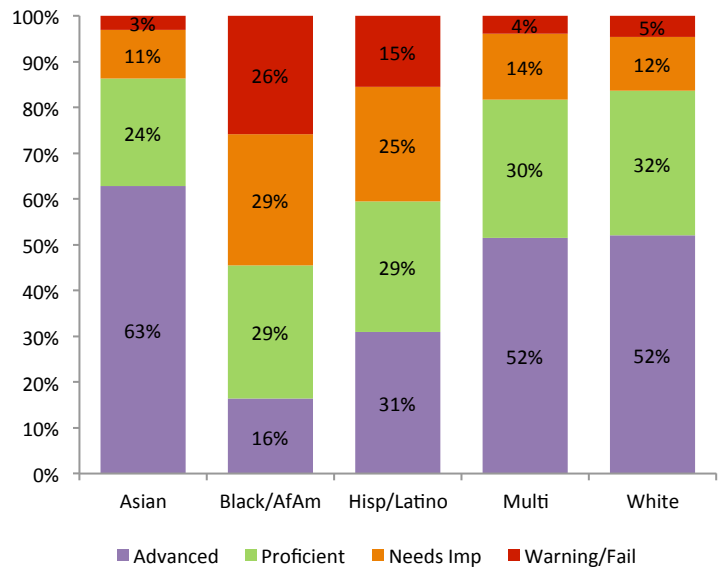
Income Status[12]

Brookline and the state of Massachusetts have similar gaps in proficiency rates for students of low-income status as compared to their non-low-income peers. Brookline reduced these gaps by 2% points in ELA since 2006. During the same period, the state reduced the gaps between these two groups of students by 11% points in ELA and 5% points in math.
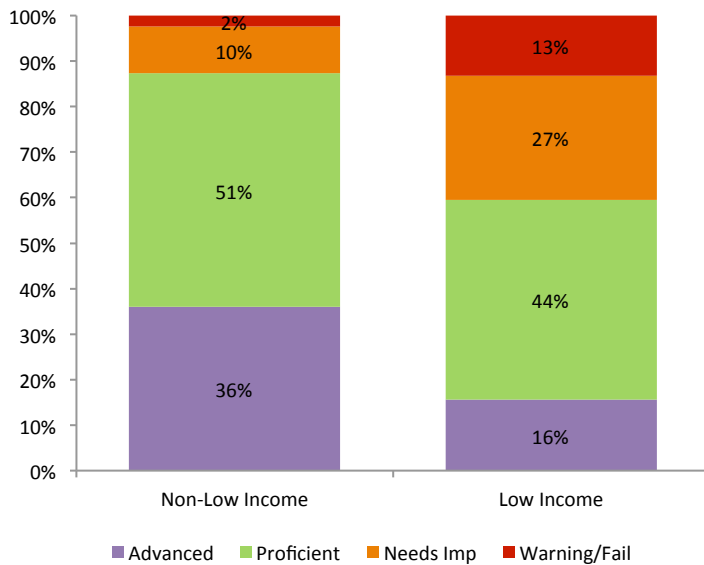
Proficiency Rate Gap Changes from 2006 to 2015 Between Non-Low Income and Low-income Students, Brookline and the State of Massachusetts[13]

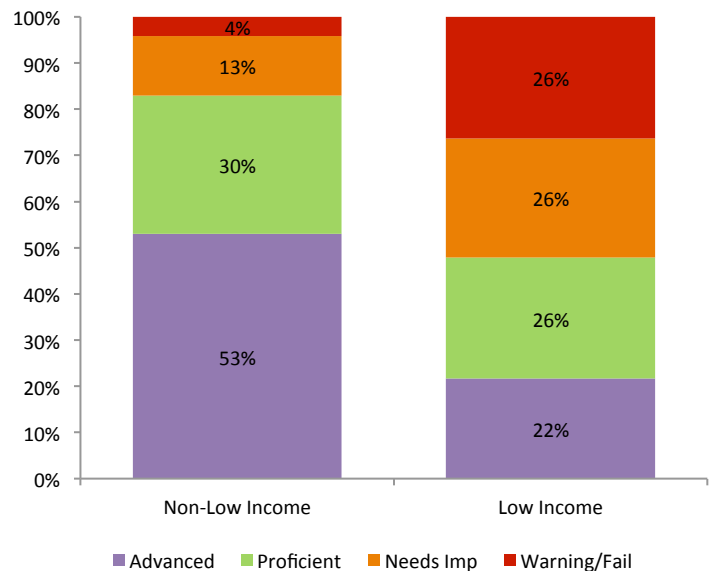|	ELA		Math	
	Brookline	**State**	**Brookline**	**State**
Low-income Status	Gap decreased 2% points from 29 to 27	Gap decreased 11% points from 34 to 23	Gap increased 1% point from 34 to 35	Gap decreased 5% points from 32 to 27

In 2015, 430 students of low-income status and 3,199 students not of low-income status completed the MCAS in Brookline. Greater percentages of students of low-income status scored in the Warning/Fail category across both math and ELA, as compared to their non-low income peers. In ELA, 40% of students with low-income status scored below proficiency, whereas only 12% of those of non-low income did. Fifty-two percent of students with low-income status did not reach proficiency in math while 17% of students with non-low income status were below proficient.

In the Advanced category in ELA, 36% of non-low income students scored Advanced in ELA, compared to 16% of students of low-income status. In math, 53% of non-low income students scored Advanced, whereas 22% of students of low-income status scored in this same category.

ELA Performance by Income Status, 2015

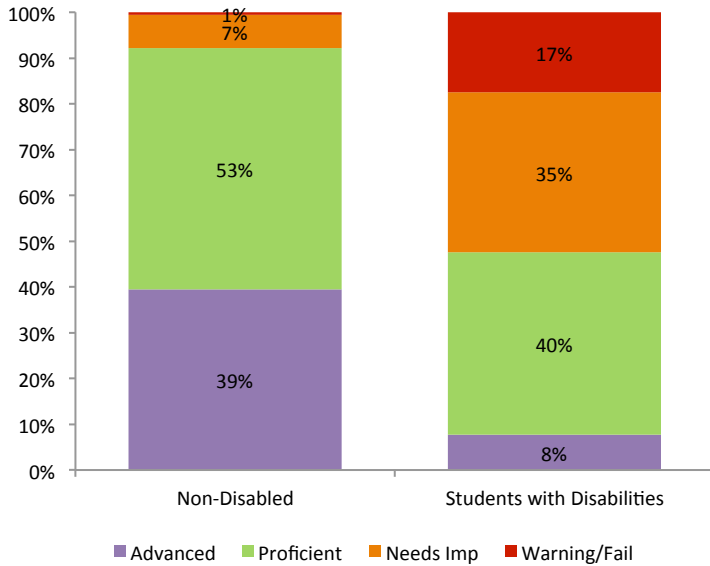**Math Performance by Income Status, 2015**

Disability Status[14]

Students with disabilities (SWD) comprised 18% of the total tested student population in Brookline. Eight percent of students without disabilities scored in the Warning/Fail category on the ELA and 11% on the math MCAS tests. Seventeen percent of students with disabilities scored in this category in ELA and 31% in Math.

ELA Performance by Disability Status, 2015

Math Performance by Disability Status, 2015

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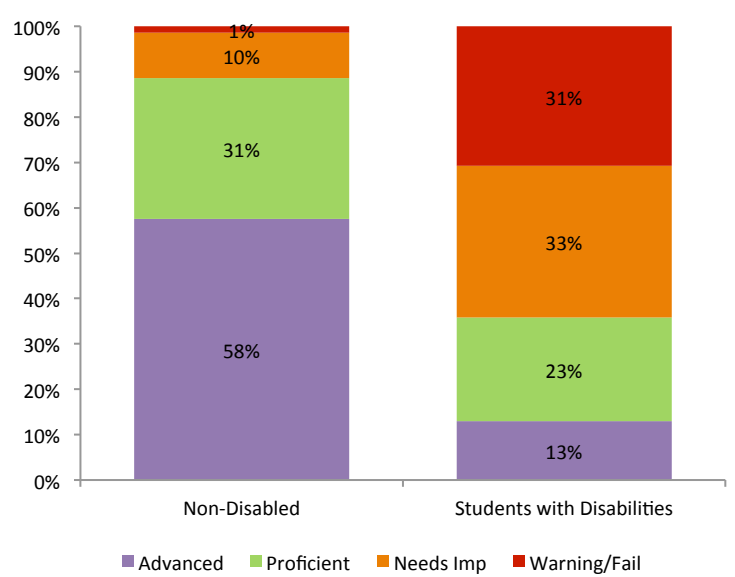
[14] The category of "students with disabilities" includes those students who have active Individualized Education Plans (IEPs); it does not include students with 504 plans. The charts presented here also do not include the 22 students who took the MCAS test while they were placed in out of district schools.

Race and Income

There were interactive effects of both income and race on students' achievement on the ELA and math MCAS tests, resulting in greater achievement gaps than we saw in individual subgroups.

Of the students of low-income status who were tested in 2015, 27% were Black/African-American, 27% were Hispanic/Latino, 20% were Asian, and 17% were White. Forty-eight percent of Black/African-American students tested were of low-income status; 31% of Hispanic/Latino, 14% of Asian, and 4% of White students were of low-income status.

In ELA, though all non-low income students achieved relatively high rates of proficiency, 70% of non-low income Black/African-American students achieved proficiency. This rate of proficiency is lower than that of low-income Asian students at 73% and low-income Multi-Racial students at 77%. Fifty percent of low-income Black/African-American and 51% of low-income Hispanic/Latino students achieved proficiency in ELA.

ELA Proficiency Rates by Race and Income Status, 2015
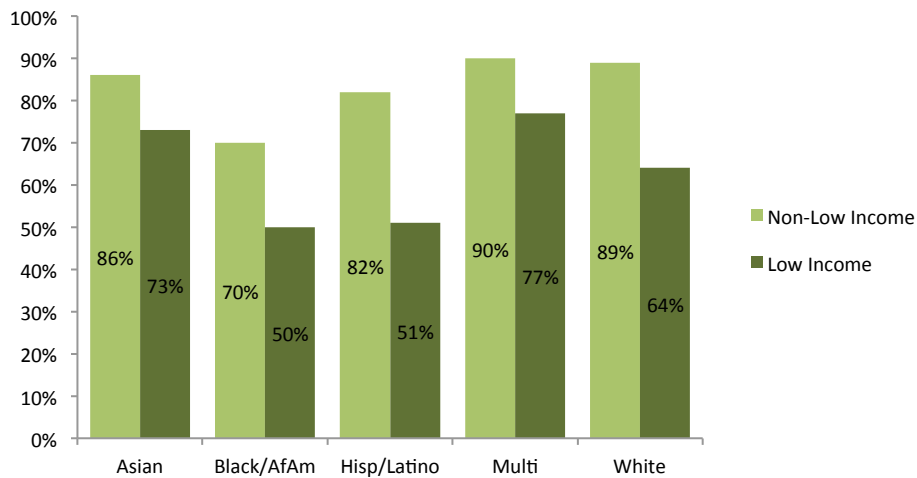
In math, non-low income Black/African-American students achieved proficiency at a lower rate than their low-income White and Asian peers (57% as compared to 59% and 77%, respectively). Similarly, non-low income Hispanic/Latino students achieved proficiency at a lower rate than their low-income Asian peers (71% as compared to 77%). Thirty-three percent of low-income Black/African-American students and 35% of low-income Hispanic/Latino students achieved proficiency in math.

Math Proficiency Rates by Race and Income Status, 2015
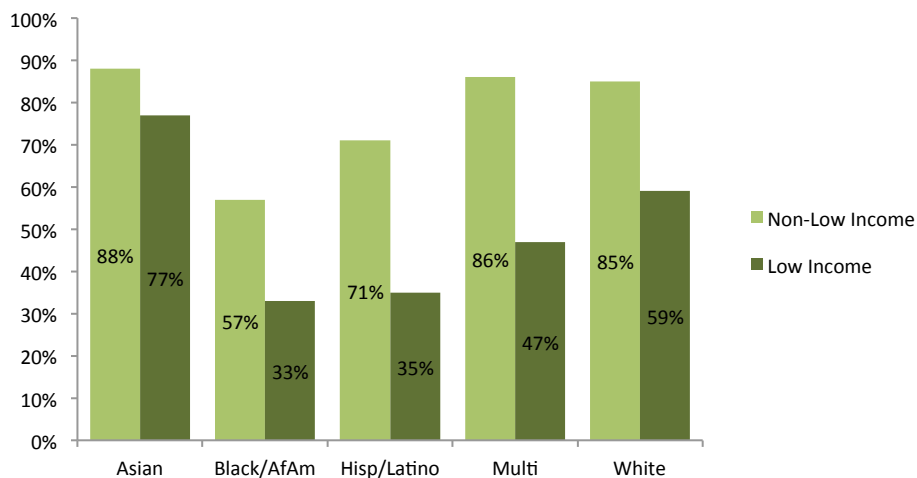
For all subgroups, being in a lower income category seemed to have the effect of reducing the percentage of students scoring at the Advanced level and increasing the percentage of students scoring in the Warning/Fail level in ELA.

Taking socioeconomic status into account, the percentage of students scoring in the Advanced category in ELA decreased for all race-based subgroups:

- Asian students decreased from 37% to 29%
- Black/African-American students decreased from 16% to 9%
- Hispanic/Latino students decreased from 30% to 6%
- Multi-Racial students decreased from 59% to 11%
- White students decreased from 37% to 27%

Similarly, when taking socioeconomic status into account, the percentage of students scoring in the Warning/Fail category in ELA increased for all race-based subgroups:

- Asian students increased from 3% to 9%
- Black/African-American students increased from 6% to 13%
- Hispanic/Latino students increased from 4% to 19%
- Multi-Racial students increased from 2% to 6%
- White students increased from 2% to 12%

The differences in performance in the highest and lowest categories (Advanced and Warning/Fail) between low-income and non-low income groups were relatively similar for Asian, Black/African-American, and White students (between 6% and 10%). The differences were more pronounced for students in the Hispanic/Latino subgroup: 24% point decrease in the percent of students scoring in the Advanced category and 15% point increase in the percent of students scoring in the Warning/Fail category.

ELA Performance by Race for Students of Non-Low Income Status, 2015

ELA Performance by Race for Students of Low Income Status, 2015

Income status seemed to have an even greater effect across all race-based subgroups in math.

Taking socioeconomic status into account, the percentage of students scoring in the Advanced category in math decreased for all race-based subgroups:

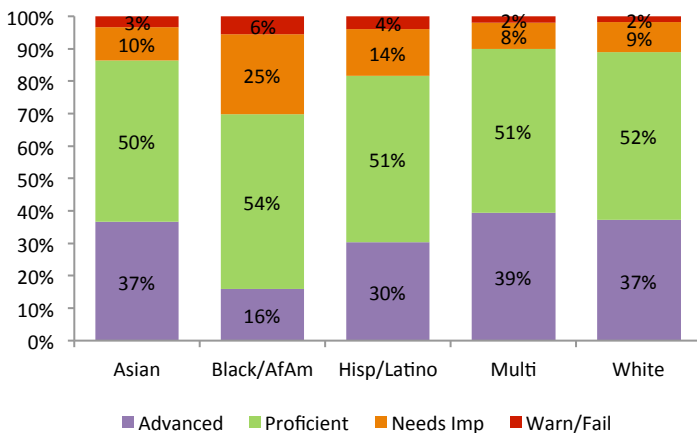- Asian students decreased from 65% to 51%
- Black/African-American students decreased from 20% to 13%
- Hispanic/Latino students decreased from 42% to 8%
- Multi-Racial students decreased from 56% to 12%
- White students decreased from 53% to 28%

Similarly, when taking socioeconomic status into account, the percentage of students scoring in the Warning/Fail category in math increased for all race-based subgroups:
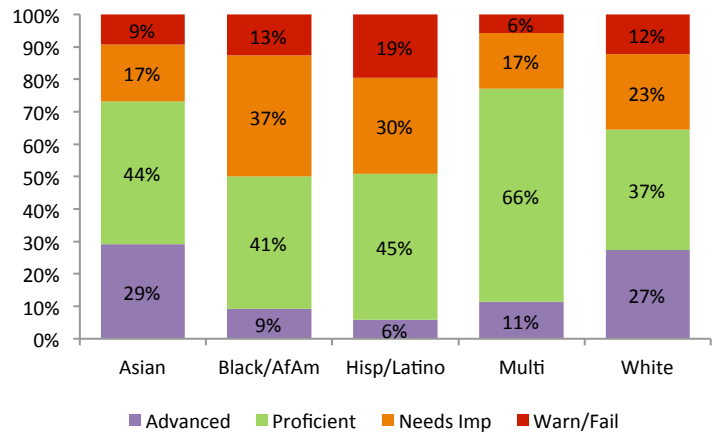
- Asian students increased from 2% to 8%
- Black/African-American students increased from 13% to 39%
- Hispanic/Latino students increased from 7% to 34%
- Multi-Racial students increased from 3% to 12%
- White students increased from 4% to 22%

Math Performance by Race for Students of Non-Low Income Status, 2015
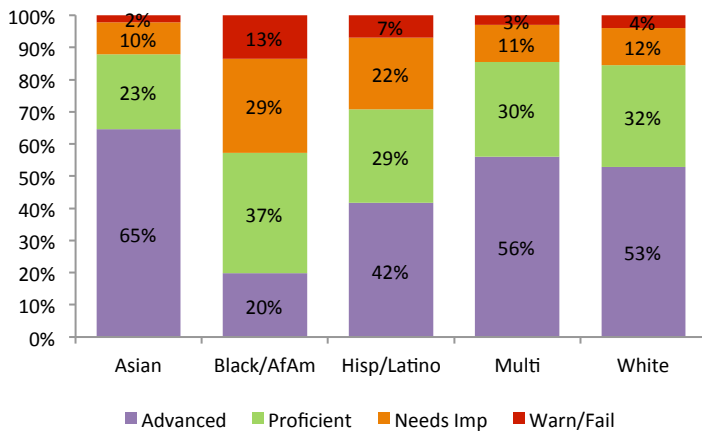
Math Performance by Race for Students of Low Income Status, 2015
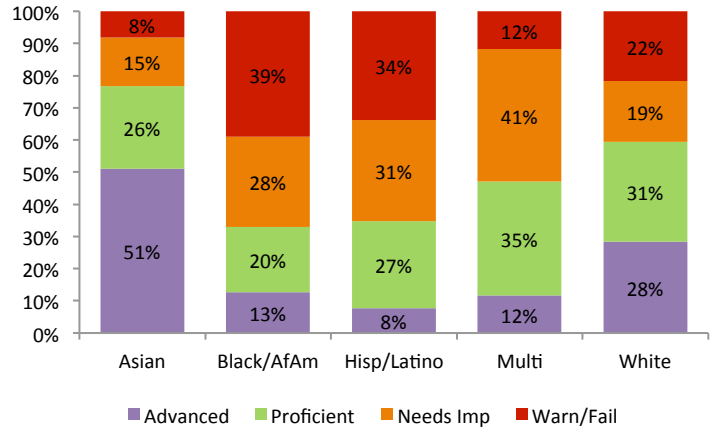
Compared to the trends in ELA, more race-based subgroups experienced large differences in the highest and lowest performance bands (Advanced and Warning/Fail) in math when socioeconomic status was considered. Hispanic/Latino and White students had the greatest differences in the percentage of students scoring in the Advanced category. When socioeconomic status was taken into account, the percentage of Hispanic/Latino students scoring in the Advanced category in math decreased 34% points; for White students, the decrease was 25% points.

Black/African-American, Hispanic/Latino, and White students had the largest increases in the percentage of students scoring in the Warning/Fail category in math when socioeconomic status was considered. The percentage of Black/African-American students scoring in the Warning/Fail category increased 26% points. For Hispanic/Latino students the increase was 27% points and for White students the increase was 18% points.

Race and Disability Status

Of the students who took the MCAS tests in 2015, roughly 18% were students with disabilities (SWD). While Black/African-American and Hispanic/Latino students comprised 17% (7% Black/African-American, 10% Hispanic/Latino) of the total tested MCAS population, they made up 30% of the students with disabilities who were tested. As shown in the table below, Black/African-American and Hispanic/Latino students are overrepresented in the population of SWD in Brookline who were tested in 2015.

	% of the overall student body	% of all SWD in each group	% of each group identified as SWD
Asian	19%	9%	9%
Black/African-American	6%	13%	36%
Hispanic/Latino	10%	17%	31%
Multi-Racial	9%	9%	18%
White	56%	52%	17%

Students with disabilities scored lower on the MCAS tests in both ELA and math regardless of their race/ethnicity.

As shown in the charts below, 47% of Asian and 56% of White students with disabilities achieved proficiency in ELA. Thirty percent of Black/African-American SWD, 32% of Hispanic/Latino SWD, and 57% of Multi-Racial SWD achieved proficiency in ELA.

In math, 46% of Asian SWD, 14% of Black/African-American SWD, 16% of Hispanic/Latino SWD, 38% of Multi-Racial SWD, and 46% of White SWD achieved proficiency.

Disability status seemed to have a greater effect across all race-based subgroups in math than in ELA

ELA and Math Proficiency Rates by Race, by Disability Status, 2015

	ELA		Math	
	Non-Disabled	Students with Disabilities	Non-Disabled	Students with Disabilities
Asian	88%	47%	91%	46%
Black/AfAm	77%	30%	63%	14%
Hisp/Latino	90%	32%	79%	16%
Multi	96%	57%	91%	38%
White	95%	56%	91%	46%

ELA Performance by Race for Students Without Disabilities, 2015

Stacked bar chart showing ELA performance:
- Asian: Advanced 39%, Proficient 50%, Needs Imp 9%, Warn/Fail 2%
- Black/AfAm: Advanced 19%, Proficient 58%, Needs Imp 23%, Warn/Fail 0%
- Hisp/Latino: Advanced 31%, Proficient 59%, Needs Imp 10%, Warn/Fail 0%
- Multi: Advanced 44%, Proficient 51%, Needs Imp 4%, Warn/Fail 0%
- White: Advanced 42%, Proficient 53%, Needs Imp 5%, Warn/Fail 0%

Legend: Advanced, Proficient, Needs Imp, Warn/Fail

ELA Performance by Race for Students with Disabilities, 2015

Stacked bar chart showing ELA performance:
- Asian: Advanced 5%, Proficient 41%, Needs Imp 33%, Warn/Fail 21%
- Black/AfAm: Advanced 1%, Proficient 29%, Needs Imp 45%, Warn/Fail 25%
- Hisp/Latino: Advanced 4%, Proficient 28%, Needs Imp 39%, Warn/Fail 29%
- Multi: Advanced 2%, Proficient 55%, Needs Imp 30%, Warn/Fail 13%
- White: Advanced 12%, Proficient 44%, Needs Imp 32%, Warn/Fail 12%

Legend: Advanced, Proficient, Needs Imp, Warn/Fail

Math Performance by Race for Students Without Disabilities, 2015

Stacked bar chart showing Math performance:
- Asian: Advanced 67%, Proficient 23%, Needs Imp 9%, Warn/Fail 1%
- Black/AfAm: Advanced 24%, Proficient 39%, Needs Imp 27%, Warn/Fail 10%
- Hisp/Latino: Advanced 43%, Proficient 36%, Needs Imp 20%, Warn/Fail 1%
- Multi: Advanced 59%, Proficient 31%, Needs Imp 9%, Warn/Fail 0%
- White: Advanced 59%, Proficient 32%, Needs Imp 8%, Warn/Fail 1%

Legend: Advanced, Proficient, Needs Imp, Warn/Fail

Math Performance by Race for Students With Disabilities, 2015

Stacked bar chart showing Math performance:
- Asian: Advanced 20%, Proficient 25%, Needs Imp 31%, Warn/Fail 24%
- Black/AfAm: Advanced 2%, Proficient 11%, Needs Imp 32%, Warn/Fail 54%
- Hisp/Latino: Advanced 3%, Proficient 12%, Needs Imp 36%, Warn/Fail 49%
- Multi: Advanced 14%, Proficient 24%, Needs Imp 41%, Warn/Fail 21%
- White: Advanced 17%, Proficient 29%, Needs Imp 32%, Warn/Fail 22%

Legend: Advanced, Proficient, Needs Imp, Warn/Fail

Income and Disability Status

Many students of low-income status achieved proficiency at lower rates than their non-low income status peers. Students of low-income status who were also SWD had lower proficiency rates of 29% in ELA and 15% in math, as compared to their non-low income peers with disabilities who achieved proficiency at rates of 54% in ELA and 43% in math.

ELA and Math Proficiency Rates, by Income Status, by Disability Status, 2015
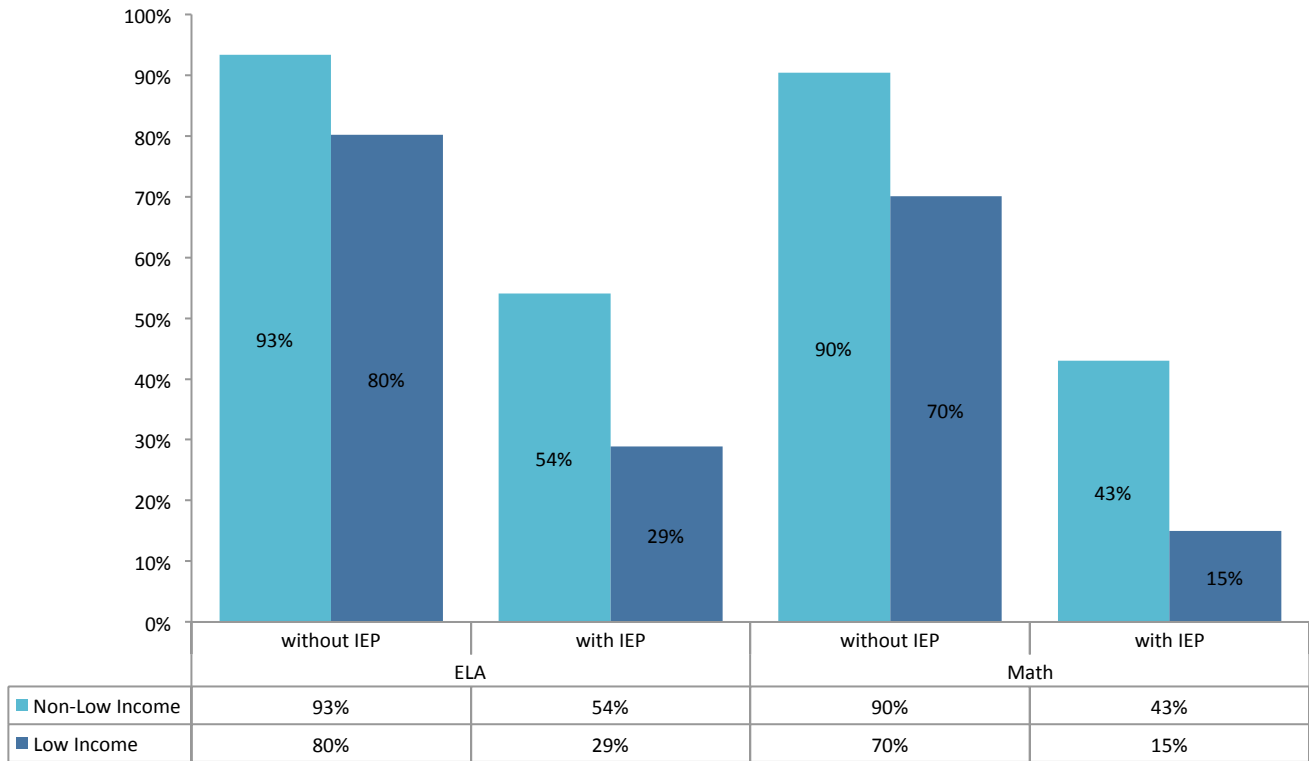
	ELA		Math	
	without IEP	with IEP	without IEP	with IEP
Non-Low Income	93%	54%	90%	43%
Low Income	80%	29%	70%	15%

ELA Performance by Income and Disability Status, 2015
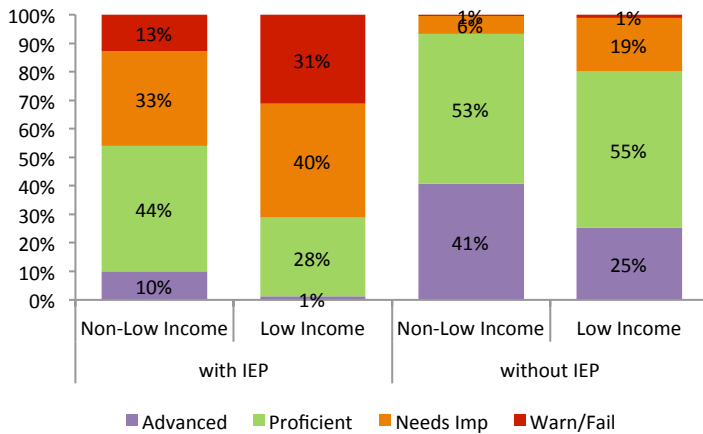
Math Performance by Income and Disability Status, 2015
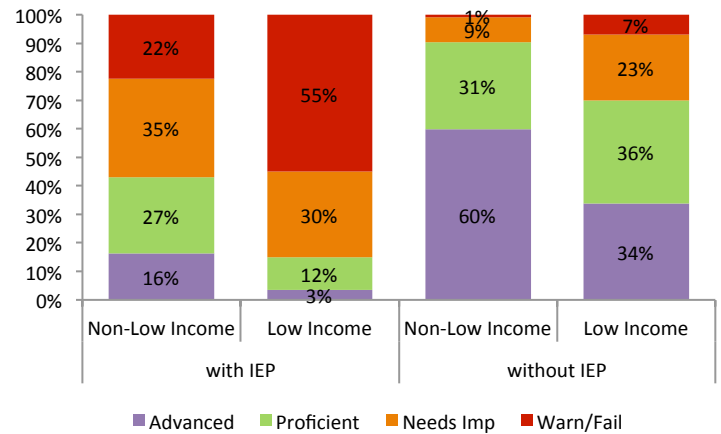
Appendix A

2015 Brookline Proficiency Rates by Subgroup

	ELA	Math
All students	84%	78%
By Race/Ethnicity		
Asian	84%	86%
Black/African-American	60%	45%
Hispanic/Latino	72%	59%
Multi	88%	82%
White	88%	83%
By Income		
Economically Disadvantaged	64%	53%
Non- Economically Disadvantaged	86%	81%
By Disability Status		
Students with Disabilities	46%	35%
Students without Disabilities	92%	89%
By Language Status		
ELL	50%	65%
Non-ELL	85%	79%
By Gender		
Female	88%	79%
Male	79%	78%
By Grade		
3rd	73%	78%
4th	72%	69%
5th	82%	76%
6th	87%	80%
7th	86%	74%
8th	91%	79%
HS	97%	93%

Appendix B

2015 Brookline Student Growth Percentiles by Subgroup

	ELA	Math
All students	59.0	59.0
By Race/Ethnicity		
Asian	64.0	71.0
Black/African-American	48.0	52.0
Hispanic/Latino	61.0	56.0
Multi	64.0	65.0
White	59.0	57.0
By Income		
Economically Disadvantaged	59.0*	55.0*
Non- Economically Disadvantaged	59.0*	60.0*
By Disability and Language Status		
Students with disabilities	46.0	50.0
LEP/ELL	65.0	61.0
By Gender		
Female	63.5	57.0
Male	56.0	62.0
By Grade		
3rd	~	~
4th	57.0	59.0
5th	59.5	60.5
6th	59.0	61.0
7th	60.0	60.0
8th	57.0	60.0
HS	63.0	57.0

Appendix C

Group Sizes

2015 Brookline MCAS Tested Students

	Asian	Black/African-American	Hispanic/Latino	Multi-Racial	White
ELA	622	244	375	334	2,052
Math	623	244	375	332	2,055

	Low-Income	Non-Low Income	With Disabilities	Without Disabilities
ELA	430	3,199	669	2,960
Math	430	3,201	673	2,958

	ELL	Non-ELL	Female	Male
ELA	135	3,494	1,799	1,830
Math	141	3,490	1,793	1,838

	3rd	4th	5th	6th	7th	8th	HS
ELA	586	502	595	520	484	489	453
Math	583	507	596	522	483	488	452

	Elementary (3rd-5th)	Middle (6th-8th)	High (10th)	Less than 3 Years in the PSB	3+ Years in the PSB
ELA	1,683	1,493	453	524	3,105
Math	1,686	1,493	452	530	3,101

Race and Income Achievement Gaps

	ELA		Math	
	Non-Low Income	**Low-Income**	**Non-Low Income**	**Low-Income**
Asian	536	86	537	86
Black/African-American	126	118	126	118
Hispanic/Latino	257	118	257	118
Multi-Racial	299	35	298	34
White	1,979	73	1,981	74

Race and Disability Achievement Gaps

	ELA		Math	
	Without Disability	**With Disability**	**Without Disability**	**With Disability**
Asian	564	58	564	59
Black/African-American	157	87	157	87
Hispanic/Latino	260	115	260	115
Multi-Racial	274	60	274	58
White	1,704	348	1,702	353

Income and Disability Achievement Gaps

	ELA		Math	
	Without Disability	**With Disability**	**Without Disability**	**With Disability**
Non-Low Income	2,703	496	2,701	500
Low Income	257	173	257	173