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POLICY BRIEF

Closing Springfield's Achievement Gap:
Innovative Ways to Use MCAS Data to Drive School Reform

by Dr. Kathleen Madigan, Theodor Rebarber, and Dr. Bruce Bean

Introduction

Business leaders, educators, policy makers, and civil rights advocates are increasingly dedicated to fundamental reform to close the achievement gap that limits hope and opportunity for students from historically disadvantaged groups. Substantial gaps in academic achievement between groups of students based on race, ethnicity and similar factors should have no place in American society in the 21st century. For those students facing such deficits, the effects can be profound. They dictate which students receive the preparation necessary to succeed in their choice of college and work, and which ones continue to be left behind.[1]

Greater use of data to inform academic decision-making has emerged as one promising strategy for creating high-performance school organizations and narrowing the gap.

While some limited reductions in the achievement gap have occurred, the remaining gap continues to be inexcusably large. Each year, millions of students depart school to enter the world of work or seek higher education. Even among those students who complete secondary education and earn a high school diploma, many from historically disadvantaged groups are being shortchanged. According to the National Assessment of Educational Progress (NAEP), the academic performance of students from minority groups in 12th grade is closer to that of white students in 8th grade than it is to that of their peers.[2] More than just committing to change, we must act with a sense of urgency that acknowledges that many students simply cannot wait year after year to see the practical effects of reform, because it will pass them by.

While educators are dedicated to reducing inequitable gaps in achievement, education reform must be designed to ensure that students from all groups and backgrounds benefit. As educators, how we close the

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gap is just as important as the fact that we must close it. Students from all backgrounds need to increase their achievement to their full potential, but students from disadvantaged backgrounds must increase their performance enough to narrow the gap. We must have a sense of urgency and purpose to accomplish these goals. Yet, urgency and purpose must be focused. Greater use of data to inform academic decision-making has emerged as one promising strategy for creating high-performance school organizations and narrowing the gap.

Having data is not the same thing as using it.

This Policy Brief discusses how data from the Massachusetts state assessment (MCAS) could be used in new ways to drive decision-making at the school district, school, and classroom levels. With the help of user-friendly data reports, educators can access vital information that allows them to accurately target strengths and needs. The reports are formatted so that they contain information about key variables to aid decision-making in organizational, professional development, instructional, and curriculum areas. The Brief includes a review of achievement gaps in district-wide data reports in one urban district, the Springfield school district in Massachusetts. This is followed by discussion of sample reports at the school and classroom levels drawn from other data sources. Together, these are used to illustrate effective, action-oriented analysis of state assessment data in support of reform.

Unfortunately, all too often, the overall MCAS score from the state assessment is all that is emphasized, publicly reported and valued.

The sample reports included in this Brief are drawn from a data reporting system developed by Community Partners Initiative (CPI) that is currently in use in several Massachusetts school districts. Although it is not the only possible approach in reporting data, the CPI system illustrates well the types of timely reports that can be useful at the district, school and classroom levels.

Data-Driven Decision Making

Having data is not the same thing as using it. A recent national study examining how urban school districts can become performance-driven organizations suggests that the development of state standards and state assessments has helped some districts to address the needs of more of their students, especially students from groups which have historically been underserved.[3] Though large urban districts still have a long way to go in meeting the needs of all students, that is indeed positive news. A recent analysis of the use of state assessment data by districts in Massachusetts confirmed the importance of the use of such data. By combining student assessment results with a district performance evaluation across key quality indicators, an in depth analysis of Massachusetts school districts found a correlation between poor student performance on MCAS and a district's failure to take advantage of the data.[4]

In addition to focusing instructional and programmatic efforts, several studies suggest that analyzing relevant data can increase awareness of academic inequities and encourage changes in perception of different groups.

Why would using data make a difference in closing the achievement gap? In addition to focusing instructional and programmatic efforts, several studies suggest that analyzing relevant data can increase awareness among educators of academic inequities and, when presented with evidence that challenges their views on student abilities, can encourage changes in perception of different groups.[5] Further, effective use of assessment data in decision-making encourages

schools to develop into learning organizations as it guides continuous improvement efforts.[6]

A Bird in the Hand

An essential component of any successful large organization is that reliable and valid data are collected, analyzed, and used to make decisions. Although the authors of this brief recognize the additional value of formative assessments, districts can start by making more effective use of the MCAS data they already receive each year from the state assessment program. Unfortunately, all too often, the overall MCAS score from the state assessment is all that is emphasized, publicly reported and valued. In other words, potentially important data are going unused, unnoticed, and eventually disregarded. Imagine if a doctor sent a patient for an x-ray to confirm his diagnosis of a broken bone. Suppose the report came back two months later that, yes, the bone is broken; nothing more. Nothing about the type of break, its precise location, how the rest of the bone looked around the break, etc. The doctor might start to view the x-ray report as unnecessary or needed mainly for insurance compliance purposes, probably less useful than his clinical skills. Teachers who do not receive timely, useful information about their students' performance, nor training in how to use it, often view the state assessment much like our hypothetical doctor would view the x-ray report—only for compliance purposes and certainly less informative than their own less formal measures and observations.

So how can we use data from the MCAS, a reliable and validated instrument, to provide accurate and practical information about student achievement for district, school and classroom use?

Using MCAS Data

MCAS is a summative assessment, primarily designed to measure how much learning has occurred near the end of an academic year. Typically, the results are used for accountability purposes, including which schools need improvement. Although not designed as a diagnostic instrument, it is possible to unlock valuable information about student learning from the MCAS data to improve organizational, programmatic, and instructional decisions.

[I]t is possible to unlock valuable information about student learning from the MCAS data to improve organizational, programmatic, and instructional decisions.

To be useful, reports relying on MCAS results must be formatted so that they contain information about key variables to aid decision-making in organizational, professional development, instructional, and curriculum areas. Equally important, data must be available in a timely manner, so that it can be used at the beginning of a new school year to establish a proactive, rather than a reactive environment. Since 2006 the Massachusetts state Department of Elementary and Secondary Education (DESE) has been piloting a comprehensive data warehouse that would make data and data analysis more accessible to schools and school districts. With regard to this new system, one district official commented, "Schools need ten or fifteen pieces of data to help kids improve, not one hundred."[7] Districts would benefit from tools and assistance in culling through this data to identify the most helpful ways to view and analyze it.

Data Sources

The district- and school-level data in this Brief were obtained from the DESE website. CPI imported Springfield School District MCAS data for school and district levels into its system and sample reports based on these data were provided. Classroom-level reports in this Brief do not rely on data from Springfield and are samples released to the public by CPI.

The Springfield School District

Springfield is located in southwestern Massachusetts. DESE lists the district's total student enrollment at 25,360. Eighty-one percent of the students receive free and reduced lunch. The demographic composition in 2008-2009 was: 54.8% Hispanic (14.3 for the State); 23.2% African-American (8.2 for the State); 15.7% White (69.9 for the State); 4.0% multi-race/non-Hispanic (2.0% for State); 2.2% Asian (5.1 for State); 0.1% Native American (0.3 for State).[8] Springfield School District facts indicate that in 2008-2009, 22% of students were identified as needing special education services and 13% are limited English proficient (LEP). The graduation rate for a four-year cohort in 2007 was 53.7% compared to 80.9% statewide.[9] The district has 44 schools: 32 elementary schools (pk-8), six middle schools (6-8), and five High schools (9-12).[10] In FY2007 the district per pupil expenditure was $12,443 compared to $11,858 statewide.

As of July 2009, the DESE rating for the district remains "very low" and the district is still under corrective action. However, Springfield need not regard this rating as a life-sentence. Springfield would benefit from a focused approach to analyzing data in order to deliver efficient and effective solutions at the organizational, programmatic, and instructional levels.

The next three sections will discuss eight different data reports that can be used by district leaders,

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Report #1

Springfield

2008 MCAS Proficiency - All Subjects and Grades (District)

District Less State (Achievement Gap vs. White Students)

More than +0 | Less than -20

Springfield

	Percent Advanced+Proficient - 2008																									
	All English & Math	# Grades > or =	English										Math										Science			
			2	3	4	5	6	7	8	9	10	11	12	2	3	4	5	6	7	8	9	10	11	12	EI	Mid	Hi
All Students																										
Dis. Less St. White	**-36.0**	**0/14**		**-31**	**-29**	**-34**	**-40**	**-46**	**-40**		**-34**				**-24**	**-25**	**-31**	**-44**	**-42**	**-43**		**-41**			**-37**	**-38**	
District				32	27	35	34	31	41		46				43	31	28	19	12	13		37			21	9	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				1886	1865	1851	1745	1860	1877		1487				1888	1875	1850	1733	1905	1875		1456			1848	1851	
African American																										
Dis. Less St. White	**-37.5**	**0/14**		**-28**	**-33**	**-33**	**-37**	**-46**	**-38**		**-31**				**-25**	**-32**	**-37**	**-46**	**-47**	**-46**		**-46**			**-42**	**-42**	
District				35	23	36	37	31	43		49				42	24	22	17	7	10		32			16	5	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				396	420	426	356	448	463		451				397	426	425	358	455	462		443			426	458	
Asian																										
Dis. Less St. White	**-7.9**	**4/14**		**-15**	**-15**	**-5**	**0**	**-25**	**-19**		**-14**				**-11**	**7**	**11**	**7**	**-13**	**-5**		**-13**			**-17**	**-31**	
District				48	41	64	74	52	62		66				56	63	70	70	41	51		65			41	16	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				42	27	46	34	39	37		41				43	27	46	34	39	37		41			46	37	
Hispanic																										
Dis. Less St. White	**-41.8**	**0/14**		**-37**	**-34**	**-42**	**-49**	**-53**	**-47**		**-44**				**-28**	**-29**	**-36**	**-47**	**-46**	**-47**		**-46**			**-42**	**-41**	
District				26	22	27	25	24	34		36				39	27	23	16	8	9		32			16	6	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				1122	1078	1039	1025	1023	1013		683				1121	1081	1036	1016	1052	1017		661			1033	1002	
Limited English Proficient																										
Dis. Less St. White	**-57.4**	**0/14**		**-49**	**-50**	**-62**	**-68**	**-72**	**-78**		**-70**				**-40**	**-41**	**-49**	**-59**	**-52**	**-56**		**-57**			**-53**	**-47**	
District				14	6	7	6	5	3		10				27	15	10	4	2	0		21			5	0	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				295	234	233	210	200	230		126				296	240	234	212	211	230		136			234	227	
Low Income																										
Dis. Less St. White	**-39.9**	**0/14**		**-35**	**-33**	**-39**	**-44**	**-50**	**-45**		**-40**				**-28**	**-29**	**-35**	**-46**	**-45**	**-45**		**-45**			**-41**	**-40**	
District				28	23	30	30	27	36		40				39	27	24	17	9	11		33			17	7	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				1618	1637	1566	1496	1567	1591		1027				1620	1643	1563	1483	1605	1586		1004			1561	1563	
SPED																										
Dis. Less St. White	**-58.3**	**0/14**		**-51**	**-47**	**-61**	**-64**	**-73**	**-72**		**-67**				**-47**	**-43**	**-53**	**-62**	**-53**	**-55**		**-68**			**-51**	**-46**	
District				12	9	8	10	4	9		13				20	13	6	1	1	1		10			7	1	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				410	422	441	472	534	523		342				408	426	440	469	559	515		336			438	505	
White																										
Dis. Less St. White	**-19.3**	**0/14**		**-11**	**-13**	**-17**	**-22**	**-27**	**-26**		**-18**				**-8**	**-6**	**-11**	**-30**	**-28**	**-27**		**-26**			**-18**	**-26**	
District				52	43	52	52	50	55		62				59	50	48	33	26	29		52			40	21	
State White				63	56	69	74	77	81		80				67	56	59	63	54	56		78			58	47	
District - # Students Taking Test				260	268	276	257	271	307		261				261	269	279	255	279	305		261			279	301	

CPI MCAS Data Tools - Page 1 of 1

#D9 - #D10 - #17 - #18

school leaders, and teachers to help identify areas of concern and steps for action.

Use of Data by District Leaders

In order to monitor needs and ensure improvement, school board members and district administrators need to determine which schools are doing well in meeting challenges (these merit acknowledgement and recognition) and which schools need more support or fundamental reform. This includes raising overall achievement as well as closing achievement gaps for students from historically disadvantaged subgroups. To this end, it is important to compare the performance of district subgroups with white students across the state to determine whether each student group is receiving an education that prepares them for success in broader society after high school.

District Leader: District-wide Reports

An initial step for a district leader reviewing MCAS data might be to look at district-wide achievement and identify gaps in academic performance for historically disadvantaged student groups. Report #1, drawn from Springfield MCAS data, examines the percentage of students at the proficient and advanced levels for major student subgroups, in each grade and subject. It compares the results for each subgroup with results for white students across the state. It addresses whether students from different subgroups are obtaining an equitable education.

In Report #1, the first column on the left lists the student subgroups by row, while the second column shows the gap in the percent attaining proficiency between each group and white students throughout the state. The third column indicates the number of grades for which the group met or exceeded the performance of white students statewide. Further to the right, similar results are available for each grade and subject. The gap for Springfield's African American students across academic subjects is very large - 37.5 percentage points out of 100. The gap for Springfield Hispanic students is even larger - 41.8 percentage points. Neither subgroup met or exceeded the performance of white students in any of the grades or subjects tested. Notably, there is also a substantial gap—19.3 percentage points—between white Springfield students and white students state-wide.

A Springfield district leader, analyzing the data in Report #1 in greater detail, would also notice that the achievement gaps typically widen as students move up the grades. In Math, Springfield's African American students are 25 percentage points behind in third grade (42 percent proficient compared to 67 percent proficient); by tenth grade, however, the gap has ballooned to 46 percentage points (32 percent proficient compared to 78 percent proficient). A similar pattern exists for other subgroups. Springfield white students are only 8 percentage points behind white students state-wide in third grade Math (59 percent proficient compared to 67 percent proficient); by tenth grade, the gap has more than tripled to 26 percentage points (52 percent proficient compared to 78 percent proficient).

Such trends must be analyzed carefully, however. For example, a reduction of the gap in English achievement for Hispanic students between seventh and tenth grade (from 53 percentage points to 44 percentage points) is probably not as positive as it at first appears. The number of Hispanic students enrolled in Springfield drops from 1,023 students in seventh grade to only 683 in tenth grade. Since dropouts tend to under-perform academically, the apparent reduction in the gap is most likely due to lower-performing Hispanic students leaving the school system, which would artificially inflate the high school results. Further investigation of the test scores of Hispanic dropouts would confirm whether this is in fact the case.

Alternatively, instead of comparing the performance of each subgroup with white students across the state, one could analyze the extent of the achievement gap for students from disadvantaged subgroups with white students enrolled within the same district. However, a district with low overall scores may be relatively

unsuccessful with students who are white as well as students from other groups (as shown above for Springfield). Comparison with white students across the state provides a useful perspective of minority students' success when contrasted with a larger proportion of the population.

Similarly, one might also compare the performance of students in each subgroup with the performance of students in the same subgroup statewide. By itself, such analysis ignores significant inequities between students from different groups but, in conjunction with other reports, can be informative. Springfield students perform worse in each subgroup even when compared to students from the same subgroups statewide. For example, the percent of African American students in Springfield attaining Proficiency in English and math is 7.7 points lower than African American students statewide; the percent of Springfield's Hispanic students achieving Proficiency in the same subjects is 9.1 points lower than Hispanic students statewide. Significantly, third grade African American students in Springfield perform slightly better than African American third graders statewide. However, this advantage is lost by fourth grade; by eighth grade, they are 15 points behind African American students statewide in English and 14 points behind in Math. In fact, for all Springfield subgroups, the performance declines at higher grades when compared to the same subgroup statewide.

COMMUNITY PARTNERS INITIATIVE

Report #2

Springfield

2008 MCAS Proficiency - All Subjects and Grades (Each School)
School Less State (Achievement Gap vs. White Students)

More than +0 | Less than -20

Springfield - Mary M Lynch

	Percent Advanced+Proficient - 2008																										
	All English & Math	# Grades > or =	English											Math											Science		
			2	3	4	5	6	7	8	9	10	11	12	2	3	4	5	6	7	8	9	10	11	12	El	Mid	Hi
All Students																											
Sch. Less St. White	**-19.7**	**0/6**		**-11**	**-32**	**-19**									**-10**	**-31**	**-15**								**-33**		
School				52	24	50									57	25	44								25		
State White				63	56	69									67	56	59								58		
School - # Students Taking Test				43	45	48									42	45	48								48		
African American																											
Sch. Less St. White	**-14.8**	**2/6**		**0**	**-29**	**-22**									**14**	**-29**	**-23**								**-40**		
School				63	27	47									81	27	36								18		
State White				63	56	69									67	56	59								58		
School - # Students Taking Test				11	11	17									11	11	17								17		
Asian																											
Sch. Less St. White																											
School																											
State White																											
School - # Students Taking Test																											
Hispanic																											
Sch. Less St. White	**-28.2**	**0/6**		**-13**	**-45**	**-33**									**-14**	**-40**	**-24**								**-40**		
School				50	11	36									53	16	35								18		
State White				63	56	69									67	56	59								58		
School - # Students Taking Test				22	19	17									21	19	17								17		
Limited English Proficient																											
Sch. Less St. White																											
School																											
State White																											
School - # Students Taking Test																											
Low Income																											
Sch. Less St. White	**-23.5**	**0/6**		**-18**	**-30**	**-24**									**-15**	**-30**	**-24**								**-35**		
School				45	26	45									52	26	35								23		
State White				63	56	69									67	56	59								58		
School - # Students Taking Test				36	35	40									35	35	40								40		
SPED																											
Sch. Less St. White	**-56.5**	**0/4**			**-49**	**-69**										**-49**	**-59**								**-58**		
School					7	0										7	0								0		
State White					56	69										56	59								58		
School - # Students Taking Test					15	10										15	10								10		
White																											
Sch. Less St. White	**1.5**	**2/2**				**1**											**2**								**-20**		
School						70											61								38		
State White						69											59								58		
School - # Students Taking Test						13											13								13		

CPI MCAS Data Tools - Page 1 of 1

#D10 - #D11 - #18 - #19

District Leader: School-by-School Reports

In addition to identifying district-wide issues that require attention, a district leader will want to review data for each individual school. Monitoring the progress of each school empowers district administrators to identify which particular schools require assistance or intervention.

The next report could help a district leader analyze the extent of achievement gaps between student subgroups for individual schools. Report #2 indicates that white students at the Mary M. Lynch school in Springfield are performing at about the same level as white students across the state; though the school serves a relatively small population of white students, it is still commendable given the overall district's lower level of success with white students. However, the school is less successful with students in other subgroups. Hispanic students are performing 28.2 percentage points below the white students statewide, while a gap of 14.8 percentage points occurs for African American students. Beyond the overall scores, a district leader may notice that students at the Mary Lynch school perform better on MCAS at grade 3 than at grades 4 and 5 for multiple subgroups, including African American, Hispanic and low-income students. Students throughout the state decline on the grade 4 MCAS, so it is important

COMMUNITY PARTNERS INITIATIVE

Report #3

MCAS Performance Over Time

Entire School

2006, 2007, 2008 MCAS Tests: Math

Hispanic Students

Standard/Strand/Type at least 10 points — HIGHER — LOWER — than All Items for the School

Grade	3			4			5			6			7			8			10		
Year	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008			
School Percentages, Proficiency Index, and Number of Students																					
Advanced+Proficient	24	8	37	10	26	6	19	16	13	17	22	17	14	20	15	31	14	31			
Needs Improvement	55	32	23	30	61	39	39	32	39	41	38	36	50	43	53	44	55	45			
Warning	21	59	40	60	13	56	42	52	47	41	41	47	36	37	32	25	31	24			
Proficiency Index	63.2	43.2	61.4	41.7	67.1	39.6	52.1	46.8	48.0	53.4	57.0	49.3	50.0	53.6	56.6	65.6	56.0	63.8			
Number of Students	38	37	35	30	38	36	36	31	38	29	32	36	28	35	34	16	29	29			
State MCAS Threshold Scores (percent correct)																					
Advanced	100	93	90	91	89	85	87	89	85	91	87	91	89	91	91	91	89	87			
Proficient	83	75	75	80	76	72	72	70	69	74	70	74	70	70	72	72	69	67			
Needs Improvement	60	55	55	50	44	44	46	44	43	48	48	50	46	48	48	48	43	44			
School Average Percent Correct																					
All Items	**70**	**49**	**62**	**50**	**63**	**42**	**50**	**46**	**45**	**54**	**57**	**53**	**51**	**52**	**55**	**63**	**51**	**55**			
Strand:																					
NS: Number Sense and Operations	73	44	59	50	66	44	50	51	51	56	57	54	54	42	58	61	53	55			
PR: Patterns, Relations, and Algebra	73	45	73	52	64	47	58	39	47	57	59	57	51	58	65	66	55	58			
GE: Geometry	57	57	65	42	53	43	39	53	52	49	49	54	52	62	35	63	58	63			
ME: Measurement	68	44	60	35	50	31	51	27	30	43	66	46	38	30	43	54	30	42			
SP: Data Analysis, Statistics, and Probability	72	57	57	62	69	39	42	58	38	62	52	49	55	65	59	68	53	57			
Item Type:																					
MC: Multiple Choice	73	52	70	59	68	57	56	51	51	65	60	60	54	55	60	67	58	60			
SA: Short Answer	62	51	59	40	69	22	54	49	58	54	28	51	52	55	61	61	41	50			
OR: Open Response	64	39	45	40	54	24	40	39	34	40	59	43	46	48	46	58	44	50			

to note that the decline for subgroups at Mary Lynch also occurs between grades 3 and 5. For example, the difference between African American students in the school and white students statewide in English is 0 points at third grade but -22 at fifth grade. Similarly in Math, the difference is +14 in favor of the school's African American students at third grade, but -23 at fifth grade.

As a district and school user of these data, it would be interesting to monitor the third grade cohort and make sure they continue to do well as they advance up the grades. Multiple reasons are possible for the relatively high scores in third grade. Especially strong curriculum and instruction in grades K through 2 may be a contributing factor, as well as what is occurring in third grade itself. A district leader reviewing these data may well wish to encourage the school administrator to investigate the apparent drop off in fourth grade and fifth grade and possible interventions. Depending on the findings of this investigation, solutions may include modifications to the professional development received by teachers at these grades, replacement of student textbooks and other possibilities.

Use of Data by School Leaders

School Leader: School-wide Results

Beyond gaps in performance between student subgroups, district and school leaders will also want to focus on data addressing other important areas. These include student performance on different content categories within each academic subject, as well as trends over multiple years.

Initially, a school administrator might review a report that provides performance data for each grade level in the school. After analyzing those data, he or she may then turn to student performance in each subgroup.

Report #3 illustrates MCAS Math performance for Hispanic students over a three-year period at an individual school. By following the performance of a class of students from one grade to the next, a school leader can identify challenges they may encounter as they progress. For example, in Report #3, students obtained a Proficiency Index score of 63.2 in third grade (2006), a Proficiency Index score of 67.1 in fourth grade (2007), but then dropped to a Proficiency Index score of 48.0 in fifth grade (2008). Similarly, 24% scored Proficient or above in third grade (2006), 26% scored Proficient or above in fourth grade (2007), then only 13% scored Proficient or above in fifth grade (2008). These are two different ways of looking at the same data, but they are telling the same tale.

Such data will only be used if it is timely, available in a format that is accessible to educators, and designed to support sound decision-making.

A school leader reviewing these data may conclude two things. First, since in the top scoring year (2007) only 26% of the students attained proficiency, that the overall performance at all three grades indicates a need for major improvement. But, second, there seems to have occurred a significant drop-off in performance between 2007 and 2008, from fourth grade to fifth grade, which requires further investigation. The school leader might check whether there was a significant change in the composition of the student group in that year (e.g., a substantial departure of higher-achieving students replaced by an influx of lower-achieving students). If the group of students did not change substantially, the next step would involve determining whether performance declined for most students at this grade, or whether the decline was limited to this population. Depending on the answer to that question, a school administrator might focus additional investigation on the fifth grade curriculum or professional development, or on instruction in particular classroom(s).

A school leader may also notice on Report #3 that students are disproportionately encountering difficulty on Open Response (OR) test questions. The first step would be to review the Open Response test questions, which are publicly released. If these

address diverse skills, and students tend to perform better on multiple-choice questions assessing a similar range of skills, it may be that students require additional practice with the Open Response format. On the other hand, if it is found that the Open Response items tend to focus on particular skills that are best assessed using this format, the cause of students' difficulty could be either the format or a deficit in the underlying skills. Of course, it is quite possible that students require instruction in both the underlying skills and the item format.

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MCAS Performance by Teacher

Entire Grade

Report #4

MCAS Test: 2008 Math Grade 5

Standard/Strand/Type at least 10 points HIGHER LOWER **than All Items**

State MCAS Threshold Scores (Percent Correct)

Advanced	**85**
Proficient	**69**
Needs Improvement	**43**

Teacher	Entire Grade	State Average	BAKER	DONOVAN	HARRIS
% Adv+Proficient	**25**	52	24	28	24
% Needs Improve	**36**	30	40	36	32
% Warning	**39**	17	36	36	44
Proficiency Index	**55.3**	76.2	57.0	56.0	53.0
# All Students	**75**		25	25	25
# Adv+Proficient	**19**		6	7	6
# Needs Improve	**27**		10	9	8
# Warning	**29**		9	9	11
Average Percent Correct					
All Items	**51**	66	51	52	50
Strand:					
NS: Number Sense and Operations	**55**	68	57	58	50
PR: Patterns, Relations, and Algebra	**53**	67	51	54	55
GE: Geometry	**57**	71	61	57	54
ME: Measurement	**35**	53	36	36	33
SP: Data Analysis, Statistics, and Probability	**46**	65	41	42	55
Item Type:					
MC: Multiple Choice	**56**	71	58	55	55
SA: Short Answer	**61**	72	65	56	62
OR: Open Response	**41**	56	38	45	40

School Leader: Classroom-by-Classroom Results

School leaders need to look at student performance in different classrooms. Report #4 provides data regarding the mathematics performance of three fifth grade classrooms, including overall math scores, performance for each content strand on the test and percent correct for each item type (i.e., multiple choice, short answer, open response). It allows performance in each of these areas to be compared to the assessment's proficiency thresholds, state averages, and the overall performance of each class.

A school leader reviewing Report #4 would notice the areas highlighted by the report but would rely on professional expertise in determining which areas require increased attention. She may note that Baker's class results on the Geometry strand are lightly highlighted, indicating that the students performed better on that strand. However, she would also notice that the students only scored 61 percent correct in this area, yet the threshold is 69 percent for Proficient and 85 percent for Advanced. Baker's class has not yet attained mastery even in this area and the school leader would expect to see further improvement.

The school leader would bring to bear similar judgment in interpreting results in other areas, including content strands more heavily highlighted for low performance. It is important to note the areas in which students score the lowest. However, it cannot be assumed that the lowest content strands should necessarily receive the most immediate attention. For example, the content strand "Measurement" is highlighted for low performance for all three classrooms in Report #4. A school leader discussing with her teachers the content strands meriting increased focus would consider several factors. For example, Number Sense includes skills that are often useful for success in other content strands; if students are not yet proficient in Number Sense, even if they score higher than in other strands, it might make sense to focus first in that area. She would work with her teachers in identifying the most effective scope and sequence for the skills required.

Report #5 is a sample of the item performance report at fifth grade in Math. The example provides student results for three fifth grade classes on an individual test item. The report contains the full item. The information at the top left includes the test year, grade level, question number, type (item format), and the percent of students statewide that answered the item correctly. The left side of the table at the bottom displays the percent of students in each class who answered the item correctly, as well as the difference with the statewide result. The right side of the same table indicates the percent of students in each class that selected each option for this four-choice question. The correct option ("C") is identified in its column.

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Report #5

MCAS Questions by Teacher

Entire Grade

MCAS Test: 2008 Math Grade 5

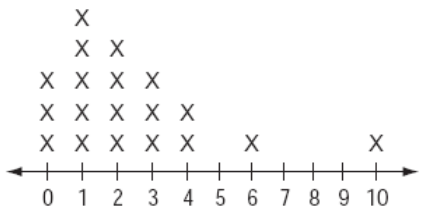
Students: 75

Teacher Minus State - at least +0%

Multiple Choice incorrect - at least 20%

Year-2008
Grade-5
Question-7
Type-MC
SP-2
State-76%

7 Ms. Ortega recorded the number of siblings (brothers and sisters) each student in her class has. Her data are shown on the line plot below.



Number of Siblings of Students in Ms. Ortega's Class

What is the total number of students in Ms. Ortega's class who have **2 or fewer** siblings?

A. 3
B. 5
C. 12
D. 20

Teacher	Number Students	Teacher Percent	Teacher Minus State	Multiple Choice				
				A	B	C - Correct	D	Blank
Entire Grade	75	52	-24	29	7	52	12	0
BAKER	25	36	-40	48	4	36	12	0
DONOVAN	25	44	-32	28	16	44	12	0
HARRIS	25	76	0	12	0	76	12	0

In this case, 52 percent of the entire grade answered this item correctly, compared with 76 percent statewide, which results in a difference of -24. But the overall score masks substantial differences in results between the three classrooms. Thirty-six percent of students in Baker's class answered the item correctly, 44 percent in Donovan's class, and 76 percent in Harris' class. While Baker's and Donovan's classes had more difficulty, Harris's class achieved the same level correct as students statewide.

With precise information about the performance of the students in each class on individual items, educators can ask better questions in order to make better decisions. For example, is Harris using different instructional strategies to teach skills necessary for this item, or did Harris' students begin the year with stronger prerequisite skills that allowed them to benefit more from the same type of instruction? Why is Harris' class more successful on this item, despite being weaker than the other classes in overall math performance? This might support the notion that Harris is using a particularly effective approach to teaching these skills, one that may benefit other teachers.

A school leader may also notice that students in the classes that had trouble with this item tended to select the first option ("A"). In this case, more students in Baker's class selected "A" than selected the correct answer ("C").

When analyzing student errors on multiple choice items, the possibility that the student guessed correctly or incorrectly is always present. A wise school leader or classroom educator would, therefore, interpret such data with caution. However, given the large percentage of students who incorrectly determined that

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MCAS Performance

Current Classes: 2009 Math Grade 7
MCAS Test: 2008 Math Grade 6
Teacher: SMITH

Report #6

Standard/Strand/Type at least 10 points HIGHER LOWER than All Items

State MCAS Threshold Scores (Percent Correct)

Advanced	91
Proficient	74
Needs Improvement	50

Current Classes	All Current Classes	State Average	7-1-Ma	7-2-Ma	7-3-Ma
% Adv+Proficient	30	56	23	38	30
% Needs Improve	38	26	41	46	25
% Warning	32	18	36	17	45
Proficiency Index	62.5	77.6	60.2	69.8	56.3
# All Students	66		22	24	20
# Adv+Proficient	20		5	9	6
# Needs Improve	25		9	11	5
# Warning	21		8	4	9
Average Percent Correct					
All Items	61	72	59	65	59
Strand					
NS: Number Sense and Operations	64	74	65	68	59
PR: Patterns, Relations, and Algebra	64	76	59	69	64
GE: Geometry	60	72	62	62	54
ME: Measurement	55	61	49	61	56
SP: Data Analysis, Statistics, and Probability	58	69	55	61	57
Item Type:					
MC: Multiple Choice	68	77	67	71	65
SA: Short Answer	61	71	58	66	57
OR: Open Response	52	64	49	57	50

"A" was the correct answer it may be useful to try to determine why it was so often selected rather than the correct answer. Reviewing the results for a cluster of individual items focusing on very similar skills may further strengthen any conclusions.

Use of Data by Teachers

Teacher: Section-by-Section Results

A teacher with multiple sections, such as an upper grade math teacher, may find Report #6 useful, which is analogous to Report #4. Report #6 provides such a teacher with data on each of his or her sections, including overall math scores, performance for each content strand on the test and percent correct for each item type (i.e., multiple choice, short answer, open response). It allows performance in each of these areas to be compared to the assessment's proficiency thresholds, state averages, and the overall performance of each class. The sample report shows a seventh grade Math teacher, Smith, with multiple sections of mathematics classes. Data from the prior year's MCAS for Smith's students would be useful at the start of the new school year. In general, interpretation of results in Report #6 would be similar to results in Report #4. Smith would note that none of the sections are at proficiency in any content strand. Smith would then seek more detailed information, such as the performance of individual students or section results for individual test questions.

Teacher: Student-by-Student Results

Also highly useful to a teacher, Report #7 provides a listing of each student's performance. Individual results are organized, from highest to lowest, in three groups: Advanced/Proficient, Needs Improvement, Warning. For each student, the report includes overall performance as well as scores for each content strand and each item type. The report identifies individual strengths and deficiencies. It also assists teachers using instructional grouping or differentiated instruction in order to meet individual student's needs. Report #7 is also potentially useful in identifying students requiring intensive supplemental services or tutoring to close the gap with their peers.

Using data to drive sound academic decision-making is a vital and promising element of school reform.

A teacher may also find it useful at the start of a new year to review how each of his or her students performed on individual questions on the previous year's test. Report #8 provides this type of information. A teacher can use such a report in identifying critical areas for instruction in the new school year.

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Report #7

MCAS Student Scores by Strand

Current Class: 2009 Math Grade 7
MCAS Test: 2008 Math Grade 6
Class ID: 7-3-Ma
Teacher: SMITH
Students: 20

Performance Levels	Raw Score	Scaled Score
A - Advanced	49-54	260-280
P - Proficient	40-48	240-258
NI - Needs Improvement High	34-39	230-238
NI - Needs Improvement Low	27-33	220-228
W - Warning High	10-26	210-218
W - Warning Low	0-9	200-208

Strand	Item Type
NS: Number Sense and Operations	MC: Multiple Choice
PR: Patterns, Relations, and Algebra	SA: Short Answer
GE: Geometry	OR: Open Response
ME: Measurement	
SP: Data Analysis, Statistics, and Probability	

Students	Raw Score	Scaled Score	Perf Level	Percent Correct																	
				All Items	Strand and Item Type Scores																
					NS	PR	GE	ME	SP										MC	SA	OR
Advanced+Proficient:																					
STUDENT 201	53	272	A	98	100	100	100	86	100										97	100	100
STUDENT 202	51	264	A	94	100	93	71	100	100										90	100	100
STUDENT 203	50	262	A	93	89	100	86	100	88										93	80	95
STUDENT 204	50	262	A	93	94	100	86	86	88										97	100	85
STUDENT 205	46	252	P	85	83	86	86	100	75										83	60	95
STUDENT 206	41	242	P	76	78	64	86	86	75										76	80	75
Needs Improvement:																					
STUDENT 207	39	238	NI	72	83	79	29	71	75										72	100	65
STUDENT 208	36	232	NI	67	56	79	86	71	50										66	100	60
STUDENT 209	35	230	NI	65	61	71	100	57	38										86	60	35
STUDENT 210	28	220	NI	52	50	57	71	29	50										45	60	60
STUDENT 211	27	220	NI	50	44	50	57	57	50										55	60	40
Warning:																					
STUDENT 212	26	218	W	48	61	50	14	57	38										59	40	35
STUDENT 213	26	218	W	48	39	64	57	29	50										59	40	35
STUDENT 214	26	218	W	48	72	43	29	43	25										72	60	10
STUDENT 215	24	218	W	44	33	57	29	29	75										59	20	30
STUDENT 216	23	218	W	43	44	50	14	29	63										52	40	30
STUDENT 217	19	216	W	35	28	29	43	29	63										45	20	25
STUDENT 218	15	214	W	28	33	43	0	29	13										48	0	5
STUDENT 219	12	212	W	22	22	36	14	29	0										28	0	20
STUDENT 220	9	208	W	17	11	21	29	0	25										24	20	5

In the question displayed in Report #8, Smith has a relatively large proportion (40%) of students who selected answer "B" (-4) instead of the correct answer "C" (-6). An educator may conclude that many students made this error because they are used to seeing the (positive) number 4 on a number line to the left of the (positive) number 5. In this case, that is incorrect because this particular number line is clearly displaying negative numbers. It's possible that some of the students were careless, but the number line is so clearly labeled that it is more likely that these students do not possess even a basic grasp of negative numbers. If a basic understanding of negative numbers is an important pre-skill for the content these students will be expected to master in the new academic year, this teacher could benefit them enormously by reviewing or re-teaching the concept of negative numbers and how these are displayed on the number line.

Conclusion

Using data to drive sound academic decision-making is a vital and promising element of school reform. When it comes to overall improvement as well as narrowing achievement gaps, repurposing MCAS data can help focus academic problem-solving at the district, school, and individual classroom levels. CPI developed an extensive system of MCAS data reports that illustrates the range of analyses that may be helpful to educators, school administrators and district policymakers. The reports used in this document represent only a sample from that system.

The data needs of district, school and classroom users are different and, in order to be useful, data reports must provide for this range of needs.

- Districts need access to data that address system-wide challenges—such as large gaps among ethnic or racial groups—permit monitoring the

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Report #8

MCAS Questions by Student

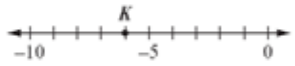
Current Class: 2009 Math Grade 7
MCAS Test: 2008 Math Grade 6
Class ID: 7-3-Ma
Teacher: SMITH
Students: 20

Class Minus State - at least +0%

Multiple Choice Incorrect - at least 20%

Year-2008
Grade-6
Question-39
Type-MC
NS-6
Class: 55%
State: 86%
Class Minus State: -31%
A-0%
B-40%
C-55%
D-5%
Blank-0%

39 Which of the following best represents the location of point K on the number line below?



A. −1
B. −4
C. −6
D. −7

Multiple Choice				
A	B	C - Correct	D	Blank
	STUDENT 219	STUDENT 212	STUDENT 217	
	STUDENT 204	STUDENT 201		
	STUDENT 213	STUDENT 208		
	STUDENT 210	STUDENT 202		
	STUDENT 215	STUDENT 209		
	STUDENT 220	STUDENT 205		
	STUDENT 203	STUDENT 214		
	STUDENT 216	STUDENT 211		
		STUDENT 206		
		STUDENT 218		
		STUDENT 207		

performance of individual schools with respect to these challenges, and allow analysis of the impact of district-wide decisions, such as textbook purchases or new professional development.

- School administrators need to be able to review the extent to which district challenges are also present in their own school. They also need to be able to monitor the success of each classroom and the extent to which instructional decisions, as well as curricular decisions delegated to the school-level, are successful in assisting students in meeting state standards.

- Classroom teachers need access to data at the beginning of the school year on the differences in academic proficiency of each of their students as well as their strengths and weaknesses.

Such data will only be used if it is timely, available in a format that is accessible to educators, and designed to support sound decision-making. In conjunction with these data, educators and administrators would benefit from professional development in effective use of assessment results.

Both summative and formative assessment systems can play key roles as school systems seek to transition into high-performance organizations. In Massachusetts, a good place for districts to start is by making more effective use of the MCAS data they already receive through the state assessment program.

Endnotes

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