

Measuring *Growth* in Student Performance on MCAS

Presented to the
Massachusetts Board of
Elementary and Secondary Education
on March 24, 2009

Uses of Growth Data

- To use as one of many factors in making *better* decisions. For example, in:
 - Identifying strengths and weaknesses in student, subgroup, school & district performance
 - Targeting assistance where needed
 - Conducting program evaluation
 - Making accountability determinations
 - Moving districts between accountability levels
 - Charter school renewal/revocation
 - Adequate Yearly Progress (AYP)

Growth Models Considered and Rejected

- Models that require an assessment system with a “vertical scale”
- Models that look at transitions across performance levels
- Models that use normalized test scores
- Models that do not use students’ entire test score history (simply look at change from one year to the next).

Growth Model Adopted

- Is being used in Colorado and Arizona
- Was developed by Dr. Damian Betebenner at the National Center for Assessment
- Does not require a “vertical scale”
- Makes use of students’ entire test score history
- Is sensitive to even small amounts of growth
- Reports growth using a familiar metric
- Provides software for generating a wide range of powerful reports that juxtapose absolute performance and growth data

Two measures of growth:

- Norm-Referenced
 - How a student's growth compares to other students with *similar previous test scores*
- Standards-Referenced
 - Whether a student's growth is sufficient to project that he/she is likely to attain proficiency, or a higher level of performance in the future.
 - Is the student "on track/off track"?

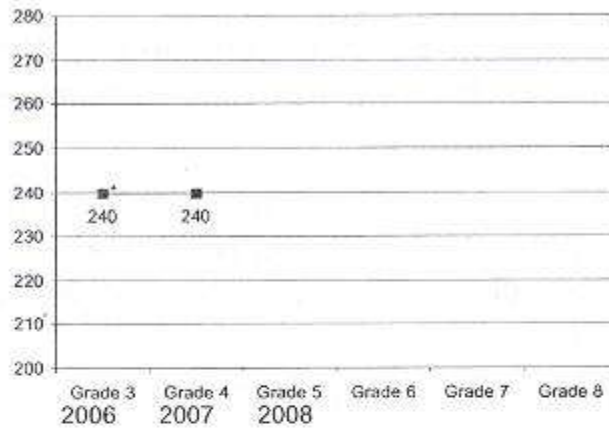


Norm-Referenced Growth

- A student's relative growth will be reported using a metric called a Student Growth Percentile (SGP). It indicates the percentage of students with similar previous test scores that the student's growth exceeded.
- For example
 - A SGP of 50 ("typical growth") indicates that a student's growth exceeded that of 50% of students with similar previous test scores.



Calculation of a SGP for a Student Who Scores 240 in ELA Grade 5, After Having Scored 240 in Grades 3 and 4

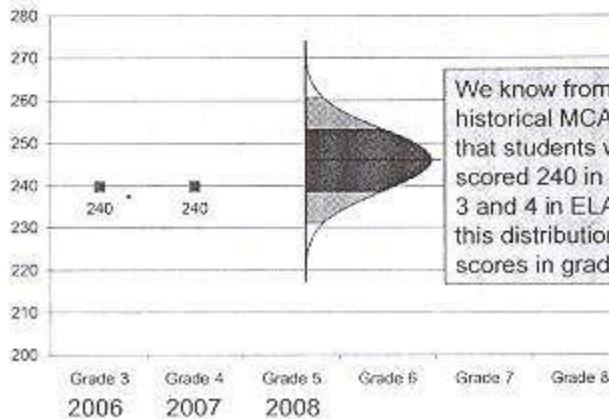


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*The raw score at the Proficient Cut

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Calculation of a SGP for a Student Who Scores 240 in ELA Grade 5, After Having Scored 240 in Grades 3 and 4



We know from our historical MCAS data that students who scored 240 in grades 3 and 4 in ELA had this distribution of scores in grade 5

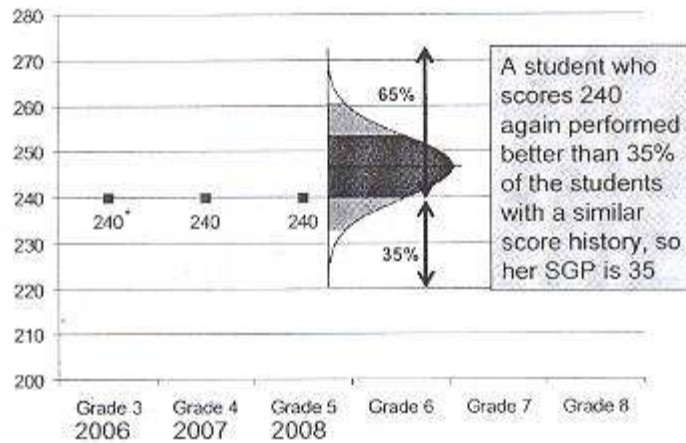


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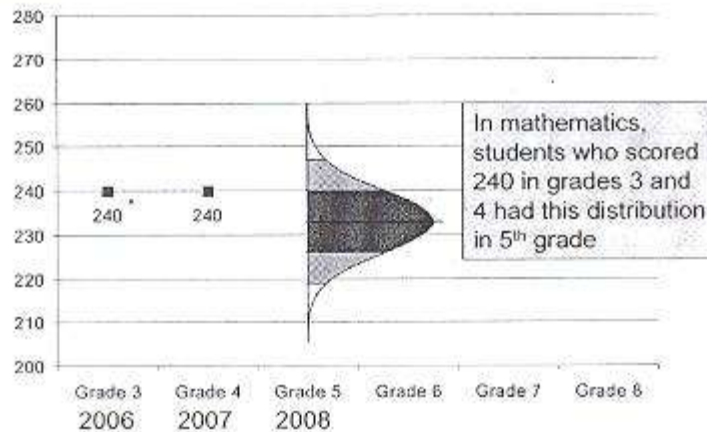
Calculation of a SGP for a Student Who Scores 240 in ELA Grade 5, After Having Scored 240 in Grades 3 and 4



*The raw score of the Proficient Cut

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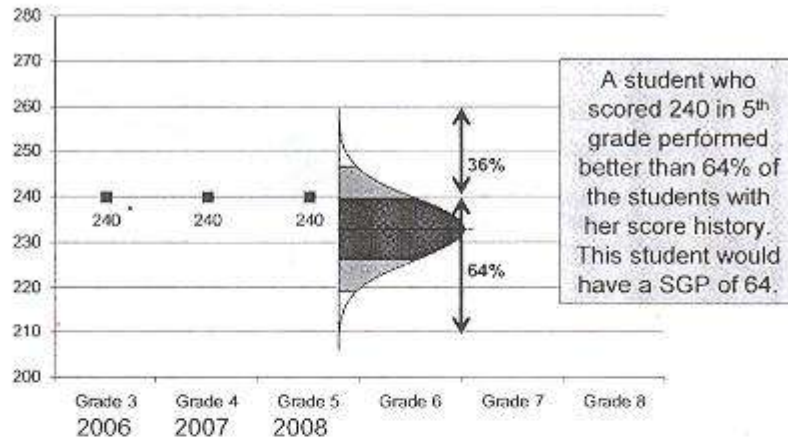
Calculation of a SGP for a Student Who Scores 240 in Math Grade 5, After Having Scored 240 in Grades 3 and 4



*The raw score of the Proficient Cut

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Calculation of the SGP for a Student Who Scores 240 in Math Grade 5, After Having Scored 240 in Grades 3 and 4



The raw score at the Proficient Cut

Example of a Student Roster Report

Fictitious Middle School, Grade 7

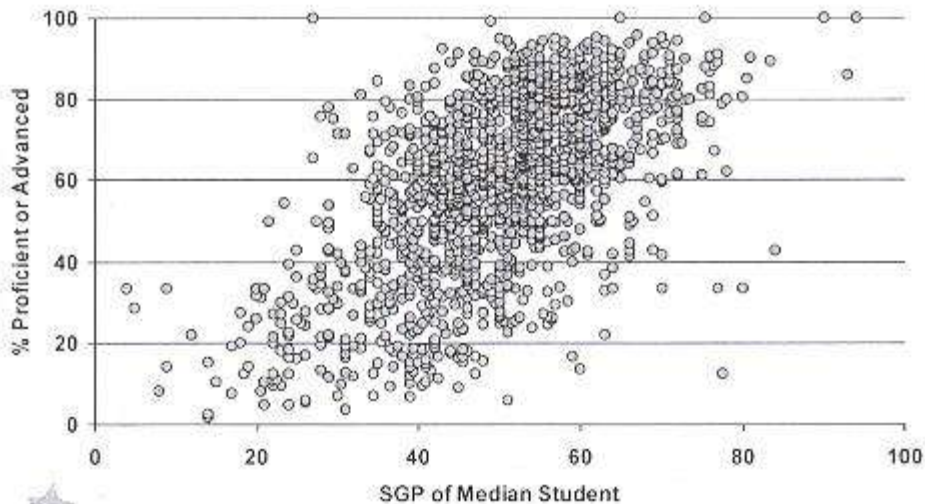
SASID	Last Name	First Name	M	ELA 2006	ELA 2007	ELA 2008	ELA SGP	On Track ELA 2009	Math 2006	Math 2007	Math 2008	Math SGP	On Track Math 2009
1234567890	ADAMS	JOHN	A	252	262	270	89	Yes	264	264	266	76	Yes
1234567891	ADAMS	ABBY	S	238	244	240	27	Yes	256	256	272	97	Yes
1234567892	MANN	TOM	H	228	234	240	88	Yes	222	224	224	51	No
1234567891	BRAND	LOU	D	216	218	214	33	No	218	226	234	83	No

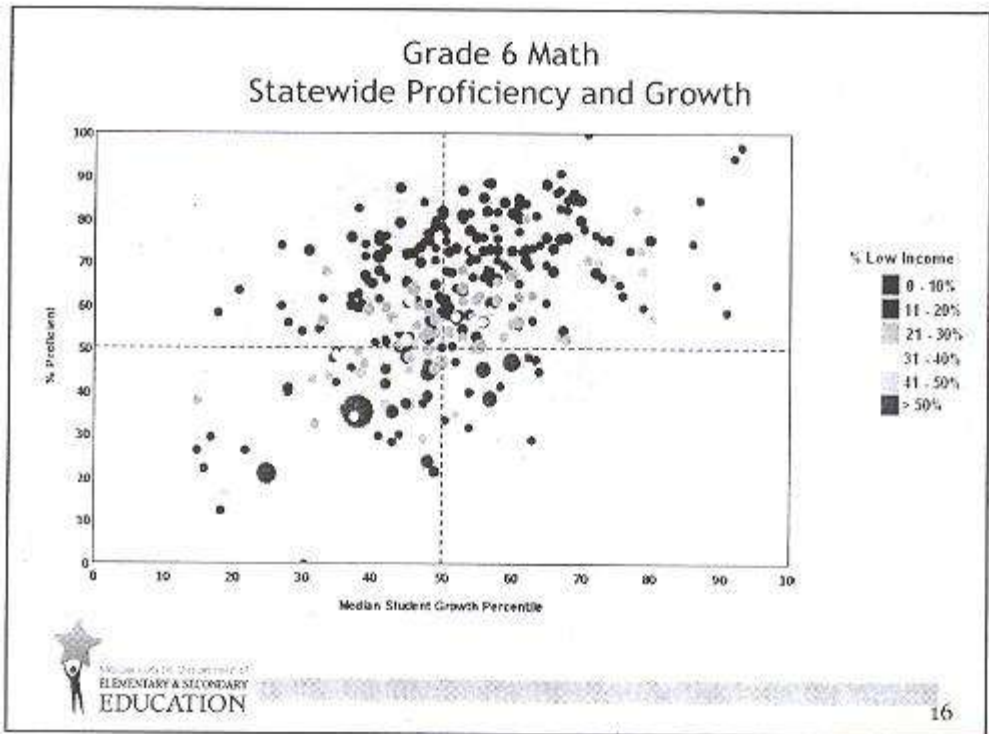
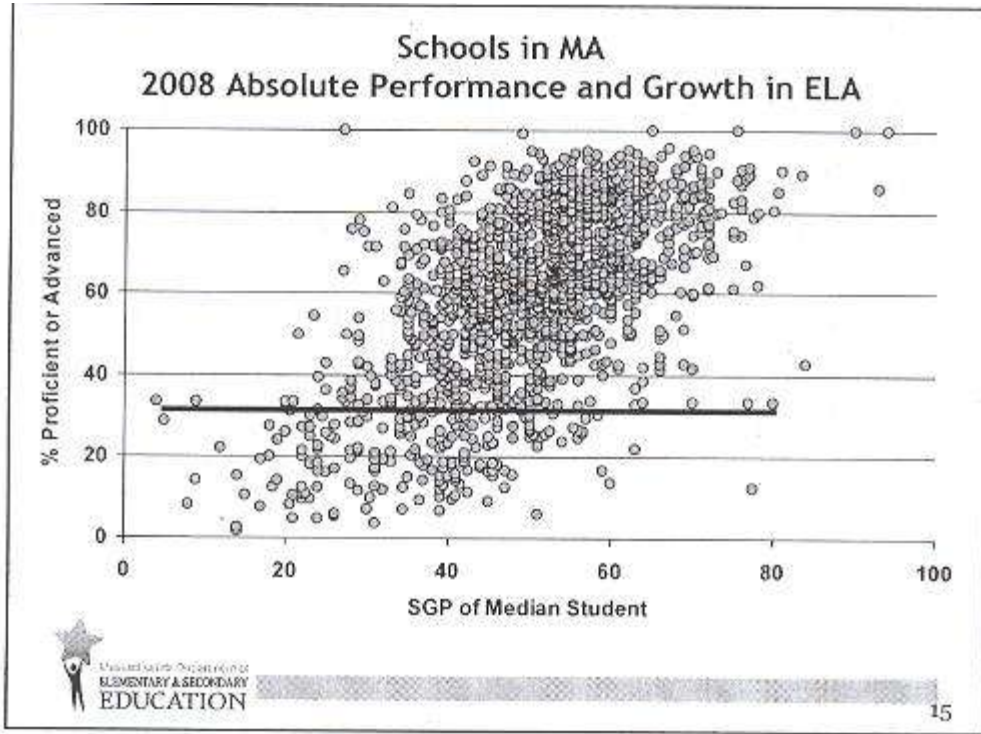


Reporting Growth at the Group Level

- To characterize growth at the group level we will report the median student growth percentile of the group.
- For example, a school with a median SGP of 60 means that half the students in the school have a SGP above 60, and half a SGP below 60.

Schools in MA
2008 Absolute Performance and Growth in ELA

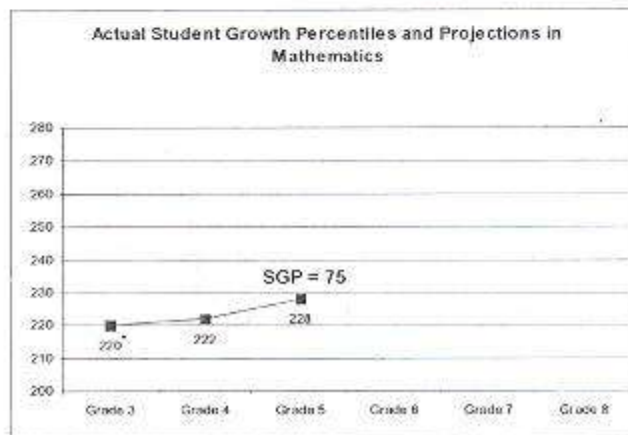




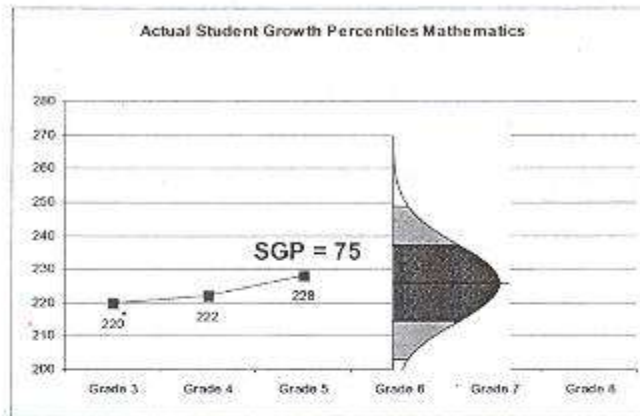
Standards-Referenced Growth

- In addition to reporting a student's relative growth, we will also report whether he/she is demonstrating *sufficient* growth to reach a desired performance target sometime in the future (e.g., Proficient in one year, two years, three years, or more).

Is a student with the testing profile in Math shown below, whose SGP in grade 5 was 75, “on track” to attain proficiency by grade 6?

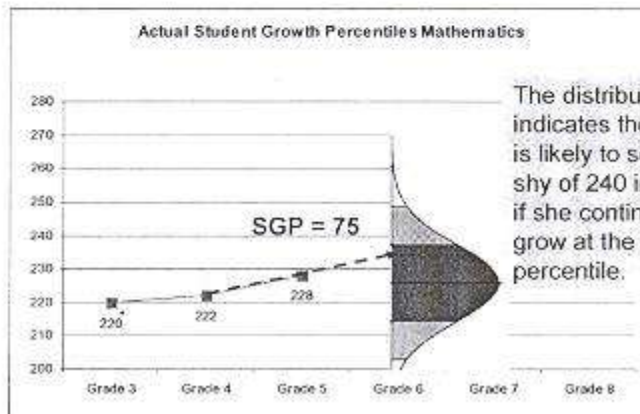


Is a student with the testing history in ELA shown below, whose SGP in grade 5 was 75, “on track” to attain proficiency by grade 6?



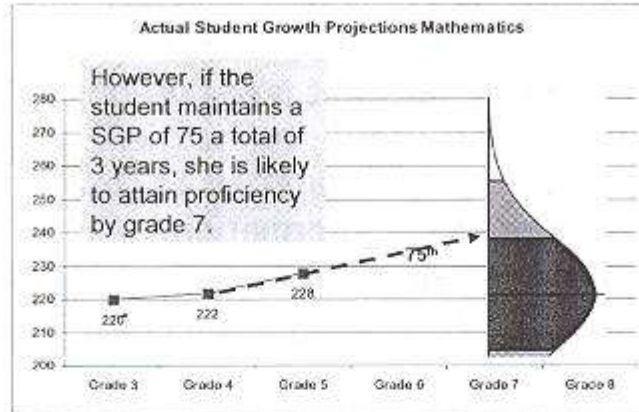
*The raw score at the Needs Improvement Cut

Is a student with the testing history in ELA shown below, whose SGP in grade 5 was 75, “on track” to attain proficiency by grade 6?

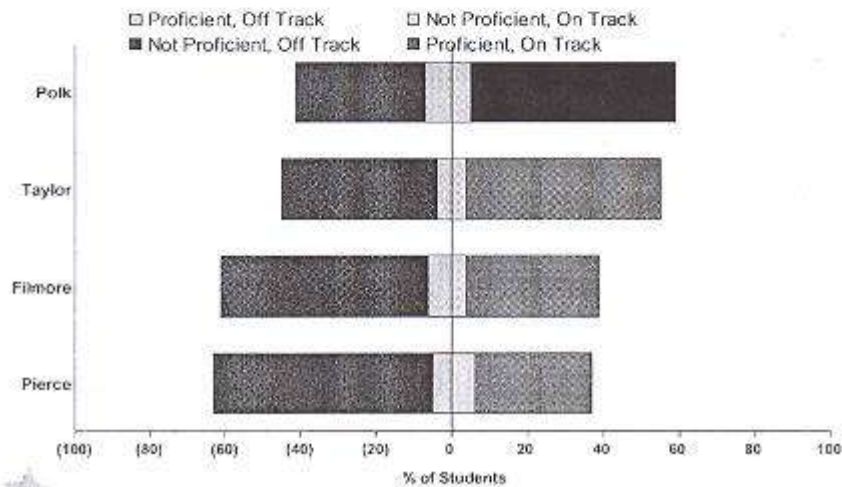


*The raw score at the Needs Improvement Cut

Is a student with the testing history in ELA shown below, whose SGP in grade 5 was 75, “on track” to attain proficiency by grade 7?



Example of a School or District Report Percentage of Students On Off Track/On Track



Pilot/Plans

- Piloting a range of reports, accessed through our data warehouse in 9 districts this spring.
- The purpose of the pilot is to determine which reports are most useful, refine them, and develop interpretive materials to guide effective use of the information.
- Plan to provide all districts access to growth data based on 2009 MCAS results next fall.

District/School Administration > Administration >

The Massachusetts Board of Education

Measuring Student Progress in Massachusetts - Development of the Growth Model

To: Members of the Board of Elementary and Secondary Education

From: Mitchell D. Chester, Ed.D., Commissioner

Date: March 13, 2009

I am writing to update you on the Department's development of a growth model. The model makes use of an important new metric we are planning to use beginning in the fall of 2009 to report the extent to which student performance, as measured by MCAS, has changed over time. This metric is an important complement to the year-by-year test scores, since it takes into account each student's prior achievement when calculating progress. At our March 24th meeting, Deputy Commissioner Jeff Nellhaus will explain the derivation of the metric; illustrate how it can be used in reports for individual students, schools, and districts; and describe how we intend to pilot the metric this spring in several districts.

Since 2003, when we began testing all students in grades 3-8 and high school in reading and mathematics on an annual basis, we have intended to develop a metric to report change in student performance over time to complement existing MCAS reports of student performance. Analyzing and reporting student growth can enable better decision-making on many levels. Such a metric can, for example, be used to:

- improve curriculum and instruction;
- make sound instructional decisions for individual students;
- inform school and district accountability decisions;
- guide the Department's assistance efforts to districts and schools; and
- conduct program evaluations.

We evaluated several different ways of calculating student progress (see appendix), but all fell short of our needs until this past fall, when we became aware of an innovative, new approach developed by Dr. Damian Betebenner at the National Center for Assessment in Dover, NH. His method is to measure students' progress relative to other students with a similar test score history. This new metric, called a *student growth percentile*, has already been implemented in the state of Colorado and with the Arizona Charter Schools Association.

With the student growth percentile metric, we can answer the questions such as:

1. What is the typical change in test scores that occurs between any two grades for students with similar prior test scores?
2. For a given student, how does his/her growth compare to students with similar prior test scores? Is it similar to, greater than, or less than typical growth?
3. Which schools demonstrate better than (or less than) typical growth for their students compared to schools with similar overall achievement (e.g., two schools might have similar percentages of students performing at the proficient/advanced levels, but one school shows higher growth from the previous year than the other)?

This information on individual students is useful for teachers and parents who want to know whether their students are progressing. When aggregated to the subgroup, school, or district level, these data can also indicate the progress made with groups of students and the impact of various programs and interventions. For example, we will be able to highlight particularly effective interventions by identifying low performing schools that consistently demonstrate high growth and then share these effective practices with other schools and districts.

Moreover, we can also use a student's growth history to generate projections of how likely that student is to reach proficiency (or any other performance benchmark) within one year, two years, or more. This could be helpful to schools in working with individual students and to our ability to focus our accountability and assistance work on the districts with high numbers of students who not only are not yet proficient but who, in addition, are not on a trajectory for proficiency.

This initiative merits further discussion. Most important, we need to determine how best to ground percentiles—a relative measure—within our standards-based system, so that we maintain high expectations for both the performance and growth for all students. This will require establishing a measure of *adequate* growth to complement the measures of *relative* growth we have already developed. This might be growth sufficient to reach proficiency or, for students already at proficiency, growth at a pace to indicate that the student will continue to perform proficiently or higher. We also need to consider whether and how we might propose to incorporate growth into our district accountability system or in determinations of Adequate Yearly Progress. We will seek the Board's input as we move

forward in these areas.

In the meantime, the Department is planning to roll out student growth data on a pilot basis with a small group of districts this spring. This will prepare us to release student-level growth calculations for all students, schools, and districts using data from the spring 2009 MCAS testing cycle. The districts participating in the pilot will help with developing reports and interpretive materials as well as with understanding the variety of ways in which the field may find the data useful. We anticipate reporting a range of reports and support including:

- student rosters for districts and schools showing growth for each student previously or currently educated;
- aggregated school and district measures of the median growth of their students and subgroups;
- visual displays arraying growth against performance;
- analyses that highlight which schools and districts are achieving particularly high growth, especially among those with relatively low performance levels;
- reports for parents on their children's growth;
- training materials and sessions to help people understand how to use the growth data; and
- training for using the Data Warehouse to access growth data.

I will provide updates to the Board over the coming months with proposals for how to handle the policy questions that arise as we learn more about what the model tells us about student performance in Massachusetts. We look forward to discussing this proposed model and its implications with you.