

Memo to: Regional School Committee

From: Jere Hochman

Date: March 21, 2008

We embarked on the district's first K-12 curriculum program evaluation this year. A committee of teachers, administrators, and parents convened to review the mathematics curriculum. In December, they completed their work and forwarded their report to me.

In response, I categorized their recommendations to guide action plans.

The information included in this agenda is:

- The Executive Summary of the K-12 Math Program Review Committee report;
- The summary of the preliminary report from the K-12 Math Program Review Committee's Student Achievement Sub-Committee;
- My response to the K-12 Math Program Review Committee's report, outlining the three categories of recommendations, action steps, and
- The preliminary timeline for the action steps.

When we report to the School Committee on Tuesday, we will discuss the results of program evaluation, present an updated timeline, give a progress report on action steps and bring survey result information. Regarding the survey results, the report writer is determining the best means of reporting comments that complement the quantitative analysis of the results.

We have learned a lot in this process and are refining the process based on this first experience in program evaluation.

I am pleased that the outcome of this report will include not only enhancements to the curriculum, but the establishment of routine school and community representation in review of our progress.

---

Report only – No action required

To: Members of Mathematics Program Review Committee  
Cc: Jere Hochman, Wendy Kohler  
Re: Preliminary Report  
From: Student Achievement Sub-committee  
Date: October 15, 2007

### Summary of Preliminary Report

Our committee was asked to examine the following three questions:

- Does the mathematics instruction program support the success of all students regardless of race, gender, cultural background, disability, or economic status?
- Does the mathematics program prepare and challenge all students?
- Are the established benchmarks for student achievement through which we measure the success of our mathematics instructional program appropriate, meaningful, and measurable?

We describe this report as preliminary because we were not able to gain access to all of the data we wanted to include. First, we requested information on grades received, in middle and high school as a function of gender, race, cultural background, and economic status, but this information was unavailable. Second, we wanted to analyze the survey data separately by race, gender, and first language (of children and parents), but were not able to have the data re-entered to allow for such analysis. This report is therefore based entirely on the data we were able to review, including survey data (students, parents, teachers), MCAS data from spring 2007, and math classes taken (8<sup>th</sup> grade and high school). This data leads us to the following conclusions:

- Students in elementary and high school find math classes more challenging than those in middle school. Similarly, while students at all three types of schools are most likely to describe their math program as “good,” more students in elementary school and high school rate the math program as “excellent” than as “adequate”, whereas more students in middle school rate the math program as “adequate” than as “excellent.” Student comments, while relatively rare, focus most consistently on a perceived lack of challenge for high achieving students (for elementary and middle students), and on the extreme differences in terms of challenge of the college-prep and honors math tracks (for high school students).
- Of the parents who chose to complete the survey, most (from all three types of schools) describe their child as often or always challenged in math class. While parents at all three types of schools are most likely to describe their math program as “good,” there are also differences in responses by type of school: more than twice as many parents of elementary school children rate the math program as “adequate” than as “excellent”, more parents of middle school children rate the math program as “adequate” or “poor” than as “excellent,” and more parents of

high school students rate the math program as “excellent” than as “adequate.” In addition, many of the parents who choose to provide comments on the elementary and middle school surveys note a lack of challenge in the curriculum for their child, and virtually all negative comments from parents of high school students comment on poor math instruction in the middle school.

- The majority of teachers who chose to complete the survey describe the quality of the math program at their school as “good” or “excellent,” but describe the math program throughout the district as either “good” or “adequate (and more describing the district math program as “poor” than “excellent”). Several teachers express dissatisfaction with the Investigations curriculum, particularly for teaching ESL students, and a desire for clearer curriculum guidelines.
- MCAS data reveal the following. First, in elementary school, the majority of students are reaching the Proficient or Above Proficient level, and these percentages are higher than state averages (somewhat above state averages for 3<sup>rd</sup> and 4<sup>th</sup> grade, and substantially above state averages for 5<sup>th</sup> and 6<sup>th</sup>). However, the percentage of students scoring below Proficient is higher among students at Crocker Farm, African American and Hispanic students, low income students, ESL students, and students with disabilities. Second, in middle school, a majority of students perform at the Proficient level or Above Proficient level, and these percentages are again considerably above state averages. Finally, in high school a substantial majority of Amherst students are performing at the Advanced/Above Proficient level and fewer than 18% are labeled below Proficient. However, the percentage of students not reaching the Proficient level during middle and high school continues to be higher among African American and Hispanic students, low income students, ESL students, and students with disabilities. In addition, male students are more likely than female students to not reach the Proficient level in 8<sup>th</sup> grade.
- The data on enrollment in math classes reveal the following. First, the data from 8<sup>th</sup> grade indicates that White and Asian students are over-represented in algebra classes, as are males, and those in higher SES groups (those who pay for lunch). In contrast, Hispanic, Black, females, and lower SES students are under-represented in 8<sup>th</sup> grade algebra. The data from high school reveals that in general, males, students on reduced lunch, Hispanics, and Blacks are over-represented in the regular math classes (this is true for Algebra I and Geometry), whereas Whites, and to some extent those in higher SES groups, Blacks, and females are over-represented in honors classes (this is the case in Geometry-Honors, Algebra I and II Honors). In BC calculus (the highest level math class offered at the high school), males, those with paid lunch, Asians, and those from multiple races are over-represented, whereas females, those with reduced lunch, Hispanics, and Blacks are under-represented.

In conclusion, most students and their parents describe the math program in Amherst public schools as challenging and good, although parents of high school students have overall more positive evaluations than parents of elementary school children, who in turn have more overall positive evaluations than parents of middle school students. Both parents and children who chose to give comments express concern about a lack of challenge for advanced students in elementary and middle school and see most resources as focusing on those who struggle with math. In contrast, the concern about math in the high school focuses on the extreme gap between the two tracks in high school, and the perceived choice to feel overly challenged (for those in honors classes) and under challenged (for those in CP classes). Teachers tend to describe the math program in their school as good/excellent, but see the math program in the district as good/adequate, and several express concern about the Investigations curriculum. MCAS data reveal that a majority of students in all grades tested reach the Proficient level, but these percentages are lower among certain subgroups of students, including Crocker Farm students, African American and Hispanic students, low income students, ESL students, and students with disabilities. Finally, data on enrollment in particular math classes in 8<sup>th</sup> through 12<sup>th</sup> grades reveal that students from some backgrounds are more likely to be enrolled in algebra in 8<sup>th</sup> grade (Whites, Asians, males, those in higher SES groups) and in Honors math classes in the high school (Whites, Blacks, females, those in higher SES groups).

Memo to: Mathematics Program Evaluation Committee

From: Jere Hochman

Date: February 12, 2008

Thank you for your work on the Mathematics Curriculum evaluation. I have read the report and met with Mike Hayes and Wendy Kohler to discuss the report and potential next steps.

In the notes below and the preliminary time line, I have clustered the recommendations and content into three areas.

To begin, we will form a K-16 Mathematics Curriculum Council comprised of teacher leaders, college and university professors, parents, students, and administrators. The purpose of this council is to be an advisory council with expertise in mathematics, to monitor progress of student achievement and curriculum implementation, and to offer advice on critical issues and topics. Concurrently, efforts will begin immediately in revising the curriculum guide, identifying measurable benchmarks, designing authentic assessments, and taking other developmental measures. Finally, efforts will begin immediately to design a mathematics professional development plan based on classroom observations, a needs assessment, and research.

Again, thank you for your efforts and dedication of time and research for our students.

1. Establish a **Mathematics Curriculum Council** comprised of teacher leaders, representatives from each of the Five Colleges and the community colleges, parent representatives, student representatives, and an administrative liaison.
  - a. Review current curriculum guide and recommendations of the Program Evaluation Committee
  - b. Read and review the NCTM Focal Points, NCTM standards, Massachusetts standards, and the current Amherst-Pelham Regional Schools curriculum guide
  - c. Monitor progress of curriculum revisions, monitor academic achievement annually, and offer advice periodically and on an as needed basis (note: first specific topic for review will be to advise on algebra for all 8<sup>th</sup> grade students which includes review of other districts with such a goal).
  
2. Establish a **Mathematics Curriculum and Instruction Committee** with sub-committees to:
  - a. Review current curriculum guide and recommendations of the Program Evaluation Committee; Read, review, and incorporate where appropriate NCTM Focal Points, NCTM standards, and Massachusetts standards
  - b. Revise the K-12 Curriculum Guide

- c. Design new K-12 Scope and Sequence flow chart and single-page grade level parent brochures
- d. Select a textbook for sixth grade and middle school
- e. Design authentic / common assessments for each grade level
- f. Determine which standardized tests and authentic assessments will be reported annually as benchmarks and include in data warehouse
- g. (Discuss rationale and develop plan to research enrolling all 8<sup>th</sup> grade students in Algebra) (see#1)

**3. Convene the **Mathematics Curriculum and Instruction Committee** to develop a comprehensive **Mathematics Professional Development Plan****

- a. Designate and implement a team of classroom observers to observe math lessons to write professional development suggestions based on a) Standards and protocols/rubric of quality mathematics planning, instruction, and authentic assessment and b) identified teachers' strengths, needs, and interests
- b. Complete a needs assessment of faculty on mathematics professional development Design summer and 2008-2009 mathematics development plan
- c. Schedule continued efforts with elementary mathematics consultants in Investigations (by grade level, school, and specialty (ELL, SE))
- d. Schedule concentrated professional development day on differentiation (including mathematics) and subsequent workshops and training in differentiation in heterogeneous math classes
- e. Schedule curriculum guide application and unit/lesson design development for elementary schools, middle school, and high school
- f. Schedule three middle school / high school combined department meetings for 2008-2009



Mathematics Program Review Recommendations and Action Plan

<b>Task</b>	Completion Date	Lead / Participants
<b>Establish a Mathematics Curriculum Council comprised of teacher leaders, representatives from each of the Five Colleges and the community colleges, parent representatives, student representatives, and an administrative liaison.</b>	By May 1	Teacher Leaders (7 + 2) Five College Reps and Community College Reps (7) Parents (3-4) Student (2-3) Administrative (Wendy Kohler and Rena Moore)
Review current curriculum guide and recommendations of the Program Evaluation Committee	June all day meeting	
Read and review the NCTM Focal Points, NCTM standards, Massachusetts standards, and the current Amherst-Pelham Regional Schools curriculum guide	June all day meeting	
Monitor progress of curriculum revisions, monitor academic achievement annually, and offer advice periodically and on an as needed basis (note: first specific topic for review will be to advise on algebra for all 8 <sup>th</sup> grade students which includes review of other districts with such a goal).	September, 2008 November, 2008 February, 2009	
<b>Establish a Mathematics Curriculum and Instruction Committee with sub-committees to:</b>	March, 2008	Wendy Kohler Full committee: Rena Moore Mike Hayes Kathy Fidler

Mathematics Program Review Recommendations and Action Plan

			MS Leader/Rep Elementary (5) Leader/Rep Elementary L/S (2) Leader/Rep
	Review current curriculum guide and recommendations of the Program Evaluation Committee; Read, review, and incorporate where appropriate NCTM Focal Points, NCTM standards, and Massachusetts standards	August, 2008	
	Revise the K-12 Curriculum Guide	August, 2008	Sub-committee
	Design new K-12 Scope and Sequence flow chart and single-page grade level parent brochures	August, 2008	Sub-committee
	Select a textbook for sixth grade and middle school	May, 2008	Sub-committee (Elem and MS)
	Design authentic / common assessments for each grade level	August, 2008	Elementary Sub-group MS Sub-group HS Sub-group
	Determine which standardized tests and authentic assessments will be reported annually as benchmarks and include in data warehouse	September, 2008	Full committee Sub-groups
	Discuss rationale and develop plan to research enrolling all 8th grade students in Algebra	May, 2008	Full Committee
	<b>Convene Mathematics Curriculum and Instruction Committee to develop a comprehensive Mathematics Professional Development Plan</b>	March, 2008	
	Designate and implement a team of classroom observers to observe math lessons to write professional development suggestions based on a) Standards and protocols/rubric of quality mathematics planning, instruction, and authentic assessment and b) identified teachers' strengths, needs, and interests	June, 2008	Observation team

Mathematics Program Review Recommendations and Action Plan

	Complete a needs assessment of faculty on mathematics professional development Design summer and 2008-2009 mathematics development plan	June, 2008	Sub-committee
	Schedule continued efforts with elementary mathematics consultants in Investigations (by grade level, school, and specialty (ELL, SE))	March, 2008 Summer, 2008 2008 - 2009	
	Schedule concentrated professional development day on differentiation (including mathematics) and subsequent workshops and training in differentiation in heterogeneous math classes	March, 2008 Summer, 2008 2008 - 2009	
	Schedule three middle school / high school combined department meetings for 2008-2009		
	Schedule curriculum guide application and unit/lesson design development for elementary schools, middle school, and high school	2008 - 2009	