Exhibit B

BALTIMORE COUNTY PUBLIC SCHOOLS

DATE: November 22, 2005

TO: **BOARD OF EDUCATION**

FROM: Dr. Joe A. Hairston, Superintendent

SUBJECT: **MATHEMATICS PROGRAM PREK-12**

ORIGINATOR: Christine M. Johns, Deputy Superintendent of Curriculum and Instruction

RESOURCE PERSON(S) Pat Baltzley, Director, Office of mathematics PreK-12
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INFORMATION

The Board of Education will receive information outlining the Baltimore County Public Schools program of Mathematics, PreK-12

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Attachment I – Executive Summary
Attachment II – State of Mathematics PreK-12 PowerPoint Presentation

STATE OF MATHEMATICS PREK-12

Executive Summary

November 22, 2005

The preK-12 mathematics program in Baltimore County Public Schools stands on the threshold of change. With a newly revised Algebra I curriculum in place this school year and a new elementary textbook adoption slated for next school year with a planned revision of the elementary mathematics program, opportunities are being built to increase student achievement in mathematics for all students. Performance Goal 1 in the *Blueprint for Progress* clearly outlines the expectations for all Baltimore County Public School students: *"By 2012, all students will reach high standards, as established by the Baltimore County Public Schools and State performance level standards, in reading/language arts, mathematics, science and social studies."* The Office of Mathematics PreK-12 is committed to this goal and to access for all students to a rigorous course of study.

The *Blueprint for Progress Report on Results for School Year 2004-2005* recently submitted to the Board of Education shows that although there is work to be done in the area of mathematics achievement, each grade level on the Maryland School Assessment (MSA) has shown an increase from the previous year. Data from the subgroups shows that major achievement increases have been made since 2003. For example, in MSA Grade 3 Math, the number of African American students who are proficient or advanced has increased 18% since 2003, from 49% to 67%. The number of Hispanic students who are proficient or advanced in Grade 3 Math has increased from 57% to 70% since 2003, a 13 percent increase. The number of FARM students who are proficient or advanced for MSA Grade 5 Math has increased 22% since 2003, from 32% proficient or advanced to 54 %. Data for the Grade 5 Cohort of 2003 indicate that this group of students has shown a consistent pattern of student achievement since 2003. This indicates that these students are maintaining or increasing their numbers in the proficient or advanced scoring range on the MSA.

All subgroups except Special Education have met the Annual Measurable Objective in all grade levels. Although gains have been made in mathematics achievement for students in the special education subgroup, program changes are needed to boost student achievement. For example, for MSA Grade 5 Math, there has been a 16% increase of the number of students in Special Education scoring proficient or advanced since 2003, from 24% to 40%. However, this group of students did not meet the Annual Measurable Objective of 47.1%. The opportunity to examine current practices and integrate new, research-based strategies for supporting all students, particularly students with special needs, presents itself with the proposed elementary mathematics textbook adoption and the slated revision to the elementary mathematics curriculum, K-5. A differentiated approach to mathematics will be developed providing opportunities for all students at all ability levels to have access to a rich, engaging, rigorous curriculum. The elementary mathematics program will be developed from a base of algebraic thinking to build the foundation needed for students to be successful in Algebra I.

At the middle school level, the program of study for students who score basic on the MSA is being reviewed both in terms of the MSA and the preparation of students for Algebra I and the Algebra/Data Analysis High School Assessment. There is a focus group in place to discuss the needs of the self-contained special education classroom at the middle school level and another focus group planned to discuss the middle school mathematics program. It is necessary to change the instructional practices and current coursework of the sixth and seventh grade mathematics program to more closely align with the expectations of the Maryland State Department of Education and the Baltimore County Public Schools and to prepare students for Algebra I.

The *Blueprint for Progress Report on Results for School Year 2004-2005* also outlines the performance of BCPS students on the High School Assessment (HSA) for Algebra/Data Analysis. The performance of students taking the Algebra HSA has not increased in the past three years. This analysis of data prompted a revision of the BCPS Algebra I curriculum and a purchase of new Algebra I textbooks, approved by the Board of Education last school year. With a strong program of professional development and a differentiated curriculum, the revised Algebra I curriculum has been implemented in all Algebra I classrooms. A process of continued, high quality professional development and constant monitoring of classrooms has been developed to ensure a full implementation of the program. Three Algebra I Benchmarks have been developed to be administered quarterly prior to the HSA in May. An electronic scoring tool has been provided to teachers with data analysis provisions and professional development has begun to help teachers use the data tool to make instructional changes and to provide intervention as soon as possible to students who are not showing success on the Algebra benchmarks. Two new courses for students with special needs, recommended through their IEP team process, were put in place. These courses, *Algebra and Data Analysis Adapted* and *Algebraic Functions Adapted*, provide the opportunity for students with a severe mathematics disability to have access to the Algebra I curriculum and appropriate preparation for the High School Assessment in Algebra/Data Analysis.

For the class of 2009, all diploma bound students need to pass the Algebra/Data Analysis High School Assessment to graduate. Since Algebra I can be taken as early as seventh grade in Baltimore County Public Schools, there are students who have already taken Algebra I who need to meet this new graduation requirement. Intervention strategies have been developed and put in place to provide for those students who have passed Algebra I but have not passed the High School Assessment. Schools under the direction of the Area Assistant Superintendents have identified those students who have not passed the HSA and have developed intervention plans for each student. This year, the graduation requirement of passing all of the HSAs in Biology, Government, and English 10 will be in place; a systemic plan for intervention for students who do not pass the HSA in a particular content area is being developed under the direction of Dr. Tom Gaul, Assistant Superintendent for Teaching and Learning.

Under Dr. Hairston's leadership, an expectation of rigorous coursework has been embraced. Baltimore County Public Schools continuously pushes students towards AP courses and college prep courses. All diploma bound students receive credits in Algebra I, Geometry, and Algebra 2 minimally – all courses needed to be successful in the SAT and needed for success in college and the work world. There are many challenges that present themselves when considering the

mathematics program for students in preK-12. The bottom line is that Baltimore County Public Schools is committed to mathematics achievement for all students and will provide the necessary support for all students to have opportunities for success in mathematics. Baltimore County Public Schools also recognizes that a highly qualified mathematics teacher is a critical element in the mathematics achievement of students. To this end, a program of sustained, high quality professional development has been developed at all levels. The Quarterly Trainings at the elementary level provide preview opportunities for teachers to ensure understanding of mathematical concepts that will be taught in subsequent quarters and the *Engaging the Millennial Mathematician* professional development program at the secondary level provides 37 workshops on topics from Algebra I Curriculum to Co-teaching with a Special Educator to Using Technology in the Secondary Mathematics Classroom. There are also several cohort programs with local universities to support BCPS teachers in acquiring highly qualified status at their teaching level or to advance their mathematics content.

The Office of Mathematics will continue to review current programs and develop new instructional programs to support all students as they access a high-quality, rigorous mathematics program that will lead them to success in future education and careers.

Attachment II

State of Mathematics PreK-12

What is the Pre K- 12 Mathematics Program?

- Curriculum and Assessments that are aligned to the Voluntary State Curriculum and Maryland Assessment Program
  - PreK-12 Curriculum
  - PreK-Grade 5
    - BCPS Curriculum Guides
    - MacMillian McGraw Hill, current textbook program
    - Unit Summative Assessments
  - Grades 6-12
    - Rigorous Course Sequence with BCPS Curriculum Guides
    - Unit Summative Assessments and Benchmarks

Maryland Standards

MSDE Assessment Program

Voluntary State Curriculum/Core Learning Goals

- MSA: Grades 3-8, ~~Geometry~~
- HSA: Algebra and Data Analysis

- New Graduation Requirements for 2009 and beyond – all students need to pass HSA's

Baltimore County Standards

- High-quality, rigorous mathematics for all students
  - Elimination of low level coursework
  - Preparation for higher level coursework beyond graduation
  - Minimum expectation of Algebra I, Geometry and Algebra 2 for graduation
  - Expectation that all students in all sub-groups will meet or exceed MSA standards.

How are we doing? MSA

- 1.1 All diploma-bound students in grades 3-8 and students enrolled in English 10 and Geometry will meet or exceed the Maryland School Assessment (MSA) Standards.

How are we doing? MSA

Percent Scoring Proficient or Advanced		
Grade	2004	2005
3	73.1	78.2
4	72.0	77.3
5	61.6	69.9
6	50.8	58.6
7	52.2	57.9
8	47.8	52.6
Geometry	42.9	40.7

How are we doing? Alt-MSA

Percent Scoring Proficient or Advanced		
Grade	2004	2005
3	92.0	84.3
4	86.4	83.8
5	89.5	83.5
6	88.5	85.5
7	90.6	85.0
8	84.8	83.7
10	75.4	78.6

How are we doing? HSA

- 1.10 All students will pass the Algebra I Maryland High School Assessment (HSA) by the end of grade 9.
  - HSA Algebra/Data Analysis in 2004-2005:

    50% of Baltimore County students passed.

    82% of middle school students passed.

    25% of high school students passed.

    11% of special education students passed.

2004 Pass Rate	**2005 Pass Rate**
51%	**50%**

What are we doing to support all students to pass the Algebra HSA?

Proactive Measures

- Support algebra concepts introduced in Elementary Grades
- Continue to review alignment of Middle school program to VSC
- Implement the revised Algebra I program
  - Implementation and pacing
  - New courses, *Algebra and Data Analysis* and *Algebraic Functions*
  - Professional dialogue and collaboration
  - Sustained, high quality professional development

What are we doing to support all students to pass the Algebra HSA?

- Administer Countywide Benchmarks, School Based Summative Assessments
  - Analyze data and provide intervention
- Discuss grading practices
- Provide immediate, intense assistance for identified teachers
- Consider thoughtful student placement
- Monitor assistance program

What if the students do not pass the HSA on the first try?

Fall 2005 Recommendations

1. Student Identification
2. Parent Contact
3. Algebra Intervention Strategies
4. Implement Strategy
5. Student Retakes Algebra HSA

Curriculum and Assessment Initiatives

- Review of BCPS Curriculum Alignment to VSC (ongoing)
- Algebra I Textbook Adoption and Curriculum (FY 06)
- New Algebra Courses (FY 06)
  - Algebra/Data Analysis Adapted
  - Algebraic Functions Adapted
- New Professional Development Program: *Engaging the Millennial Mathematician* (FY06)

Curriculum and Assessment Initiatives

- Focus group for Middle School special education (FY06)
- Grade 9 STEM Pilot (FY06)
- Middle School Program Review (FY 06)
- Pre-Calculus Courses Review (FY06)
- Proposed K-5 Text Adoption (FY 07)
- Revision of K-5 Elementary Mathematics Program (FY07)
- College Readiness Math course (pilot FY07)

Challenges

- Ensuring that all students pass the HSA Algebra/Data Analysis – a graduation requirement for all diploma bound students
- Ensuring that all students are proficient or advanced who participate in MSA
- Ensuring that all students are proficient or advanced who participate in Alt-MSA
- Ensuring that all students graduate prepared for many opportunities beyond high school

What does this mean for the mathematics program in BCPS?

- Mathematics achievement for ALL students
- Necessary support provided for ALL students
- Content knowledge and pedagogy for ALL teachers
- Sustained professional development
- Rigorous coursework for ALL students