

BALTIMORE COUNTY PUBLIC SCHOOLS

DATE: March 14, 2006

TO: **BOARD OF EDUCATION**

FROM: Dr. Joe A. Hairston, Superintendent

SUBJECT: **REPORT ON PRE-K THROUGH 12 MATHEMATICS**

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

RESOURCE PERSON(S): Patricia Baltzley, Director of Mathematics, PreK-12

INFORMATION

The Board of Education will be updated on the Plan of Action for Mathematics Pre-K through 12.

Attachment I – Executive Summary
Attachment II – PowerPoint™ presentation

THE PLAN OF ACTION FOR MATHEMATICS PreK-12

Executive Summary

March 14, 2006

The *Blueprint for Progress Report on Results for School Year 2004-2005* submitted to the Board of Education earlier this school year, shows the state of mathematics achievement in Baltimore County. Each grade level on the Maryland School Assessment (MSA) continues to achieve an increase from the previous year. However, as the difficulty of mathematical content increases each year, consideration needs to be given to ensuring that the level of mathematical instruction and curriculum support is provided for all students to move toward proficiency each year. Algebraic thinking and concepts must permeate all mathematics instruction from preK through grade 12 in order for students to be successful in Algebra I, a graduation requirement for all students in the classes of 2009 and beyond.

The preK-12 mathematics program in Baltimore County Public Schools stands on the threshold of change. With a revised Algebra I curriculum in place this school year, a middle school program for algebraic thinking and a new elementary mathematics program slated for next school year, student achievement will increase. 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.”

For the class of 2009, all diploma bound students must pass the Algebra/Data Analysis High School Assessment to graduate. A process of continued, high quality professional development and constant monitoring of classrooms by principals, area assistant superintendents, and central office has been developed to ensure full implementation of the Algebra I program. Algebra I benchmarks will be administered quarterly prior to the HSA in May. Two additional courses for students with special needs, recommended through their IEP team process, are in place. These courses, *Algebra and Data Analysis Adapted* and *Algebraic Functions Adapted*, provide the opportunity for students with significant mathematics disabilities to have access to the Algebra I curriculum and appropriate preparation for the High School Assessment in Algebra/Data Analysis.

Under Dr. Hairston’s leadership, an expectation of rigorous coursework has been established so that all students will be proficient on the Algebra HSA and will be prepared to enroll in Advanced Placement and college preparatory courses. Diploma bound students receive credits in Algebra I, Geometry, and Algebra II – all courses needed to be successful on the SAT and needed for success in college and the work world. 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.



Plan of Action for Mathematics PreK-12

Baltimore County Public Schools

Office of Mathematics PreK-12

Pat Baltzley, Director

John Staley, Secondary Coordinator

Cindy Dennis, Elementary Coordinator



What will our graduates look like mathematically?

- 🌸 Mathematically numerate
- 🌸 Algebraic thinkers
- 🌸 Problem solvers
- 🌸 Ready for college or work after high school
- 🌸 Masters of the HSA Algebra – all students will need to take and PASS the HSA Algebra in order to graduate

We need to have our students prepared!



PreK-12 Preparation

Systemwide curriculum for every grade that affords all students the opportunity to progress through a continuum of mathematics to prepare them for a competence in mathematics

- ⌘ Knowledge of Algebra, Patterns, and Functions
- ⌘ Knowledge of Geometry
- ⌘ Knowledge of Measurement
- ⌘ Knowledge of Statistics
- ⌘ Knowledge of Probability
- ⌘ Knowledge of Number Relationships and Computation/Arithmetic



PreK-12 Preparation

Goal for PreK-12

The development of algebraic thinking for student success in mastering algebra



MSA/HSA Results 2004-2005

| 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 |
| MSA/HSA Algebra | 51.0 | 50.0 |



MSA/HSA Action

MSA/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.

In 2006, the AYP for mathematics will be based on the students' performance on the HSA Algebra/Data Analysis.

The Classes of 2009 and beyond are required to pass the HSA Algebra/Data Analysis in order to graduate.



Prior Actions

- ✿ 2000-2004
 - ⌘ Aligned Algebra I curriculum to the Core Learning Goals
 - ⌘ Eliminated all low-level mathematics courses
 - ⌘ Created countywide unit summative assessments
 - ⌘ Provided professional development to teachers on the specifics of the HSA and rangefinding
 - ⌘ Backward mapped Algebra I curriculum into grades K-8



Prior Actions

❁ 2004-2005

- ⌘ Revised Algebra I curriculum with support from a new textbook
- ⌘ Revised unit assessments and created benchmarks to monitor students' progress toward mastering the Core Learning Goals
- ⌘ Provided a week-long professional development for all Algebra I teachers
- ⌘ Continued to support algebra concepts introduced in the elementary grades



The Action for 2005-2006

- ❁ Implement a revised Algebra I county program
- ❁ Monitor the implementation of new courses, *Algebra and Data Analysis Adapted* and *Algebraic Functions Adapted*
- ❁ Implement countywide benchmarks and school-based short-cycle assessments
- ❁ Provide sustained, high quality professional development
- ❁ Provide support to priority schools
- ❁ Pilot the Algebra I course of the Grade 9 Concepts of Physical Science as Applied to Biology program



The Action for 2006-2007

- ❁ Continue to monitor the effective implementation of the BCPS Algebra I curriculum
- ❁ Continue to offer sustained, high-quality professional development for all Algebra I teachers
- ❁ Continue to analyze data and support students through the administration of the countywide benchmarks
- ❁ Continue to provide support to priority schools



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MSA/HSA Action

- ❁ As our scores at each grade level continue to increase each year, consideration needs to be made for the increasing difficulty of content from grade to grade
- ❁ The BCPS middle school mathematics program must provide all of our students with the learning necessary to be prepared for success with Algebra I in grade 9



Prior Actions

🌸 2002-2005

- ⌘ Aligned countywide middle school curricula to the Voluntary State Curriculum
- ⌘ Created MSA resources for use in classrooms
- ⌘ Created benchmarks to monitor the progress of students towards mastery of the VSC
- ⌘ Established cohorts for teacher to become highly qualified
- ⌘ Developed a rigorous Pre-algebra course for grades 7 and 8
- ⌘ Provide support for priority schools



The Action for 2005-2006

- ❁ Strengthen the alignment of the current middle school curriculum to the Voluntary State Curriculum
- ❁ Monitor the implementation of the countywide Pre-algebra program
- ❁ Provide resources for MSA review for all schools
- ❁ Provide sustained, high-quality professional development for all middle school teachers
- ❁ Continue to support priority schools



The Action for 2006-2007

- ❁ Review of Middle School Program
 - ⌘ With a focus on results for special education and English Language Learners
- ❁ Proposal in FY07 Budget for *Algebraic Thinking* for Grades 6 and 7
- ❁ Continuation of programs to improve highly qualified status of middle school teachers
- ❁ Sustained, high quality professional development



MSA/HSA Results 2004-2005

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MSA/HSA Action

- ❁ Strong elementary MSA Scores that continue to increase
- ❁ Development of content knowledge of elementary teachers that promotes understanding of mathematics by all students
- ❁ Development of algebraic thinking that provides foundation for Algebra I success



Prior Actions

🌸 2000-2005

- ⌘ Aligned curricula to the Voluntary State Curriculum
- ⌘ Created planning grids to support instruction in the elementary classrooms
- ⌘ Developed unit summative assessments to help teachers monitor students' progress towards mastery on the MSA
- ⌘ Provided professional development for all teachers in content and MSA specifics
- ⌘ Hired STEM resource teachers for 38 schools
- ⌘ Established cohorts for teachers to increase their mathematics content knowledge



The Action for 2006-2007

New Elementary Mathematics
Textbook Program

Grades 1-5

Scott Foresman-Addison Wesley
Core Basal Textbook

Blended with
Blended with
Investigations

Kindergarten – *Investigations* exclusively



The Action for 2006-2007

- ❁ Provide for key staff development to emphasize components of the program
- ❁ Revise the Planning Grids, Summative Assessments, and Assessment Calendars
 - ⌘ Align with Voluntary State Curriculum
 - ⌘ Backwards map from Algebra I
 - ⌘ Develop number sense and algebraic thinking
- ❁ Continue with extensive, regular professional development
- ❁ Pilot Project SEED in identified schools to promote mathematical discourse



Blueprint for Progress

- ❁ 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