

## Overview of the 6<sup>th</sup> Grade Mathematics Changes

Prior to the 2009-2010 school year, there were **two** options for general education students in terms of math instruction at Pearl R. Miller Middle School, **Math 6R** and **Math 6A**:

### *6<sup>th</sup> Grade Math*

*The sixth grade mathematics program includes the study of data analysis, probability and statistics, a review of numeration and measurement, and computation of the four basic operations with whole numbers, decimals and fractions. Plane and solid geometry are also explored with a special unit on coordinate graphing. A more rigorous program is offered in order to challenge the most capable students, in addition to providing a more in-depth and rigorous study of the above concepts. Pre-algebra with integers and graphing are also studied.*

### *Goals:*

- 1) To use a problem-solving approach which emphasizes the National Council of Teachers of Mathematics (NCTM) Standards*
- 2) To develop the confidence, knowledge and techniques for using math to reason and solve problems in everyday life and be able to communicate mathematically*
- 3) To help students value mathematics and its connection to all subjects*

*Additionally, a mathematics resource program is offered to classified students. The program parallels the regular curriculum with modifications based on the implementation of the student's Individual Educational Plan.*

As of the 2009-2010 school year, **one** program of instruction will be offered in the general education setting. **It will be the more rigorous program of instruction that will include in-depth and thorough study of the 6<sup>th</sup> grade math concepts along with pre-algebra, integers, and graphing.**

### **Rationale**

There are several reasons these changes are being implemented with the most important being that out of a generalist classroom such as those at Stonybrook, it is very difficult to determine proper math placement in sixth grade. This is a good example of where perception is not always reality. Sixth grade is an important year for abstract thought development. By offering more rigorous curriculum to all students in sixth grade, it will allow more students access to algebra earlier leading to higher level math, honors, AP, and ultimately better scores on state tests and SATs. Research abounds in this area. In several studies, when students were placed in a higher math class either by accident or design, the students were much more likely to be successful in future advanced math classes.

### **Changes Will Not Diminish Instruction – Only Enhance**

If a student would have been recommended to Math 6A, the accelerated program, they would have received this curriculum. Therefore, these changes do not diminish what students would have gotten – instead, they enhance instruction for all. Recently, the 6th grade teachers visited Millburn Middle School to observe their 6<sup>th</sup> grade mathematics program. The Millburn School District has been offering one rigorous 6th grade math program to all students for many years. This is essentially the same curriculum we have offered as Math 6A. Millburn's success can be seen easily as Millburn HS is one of the finest in NJ. In order to ensure an instructional benefit to all students regardless of academic level, a specific scope, sequence and pacing chart is being developed and will be implemented this fall.

## Research Excerpts:

*“Detracking – if it is accompanied by high expectations for all students, sufficient resources, and a commitment to the belief that students can achieve when they have access to an enriched curriculum, is an effective strategy to help students reach high standards – and does not harm the achievement of higher-achieving students.”*

Burris, Carol; Wiley, Ed; Welner, Kevin and Murphy, John. *Accountability, Rigor, and Detracking: Achievement Effects of Embracing a Challenging Curriculum as a Universal Good for All Students*. Teachers College Record, March 2008, Vol. 110, #3.

*“The findings of this study should help to alleviate the concerns of those who fear that high achievers will learn less if they are placed in classes with low-achieving students,” conclude the authors, “and that lower achievers will be frustrated when given high-track curriculum.”*

Garrity, Delia. *Detracking With Vigilance*. The School Administrator. August 2004

*“The main results indicate that low-ability students achieve more and are more motivated to learn in heterogeneous groups. Average-ability students perform better in homogeneous groups whereas high-ability students show equally strong learning outcomes in homogeneous and heterogeneous groups. Results on social interaction indicate that heterogeneous groups produce higher proportions of individual elaborations, whereas homogeneous groups use relatively more collaborative elaborations.”*

Saleh, Mohammad; Izonder, Ard; De Jong, Ton. *Effects of within-class ability grouping on social interaction, achievement, and motivation*. Instructional Science. Volume 33, Number 2 / March, 2005.