

## Differentiated Math Instruction at Mansfield Middle School

May 2010

Dear Parents,

As we begin our planning this spring for the next school year, we thought that you might find an overview of our math program to be helpful. The descriptions below cover all aspects of math instruction at MMS: the grade-level *Bridges in Mathematics* and *Math in Context* curricula, our accelerated programs, and our remedial and special education services.

### **OVERVIEW**

At Mansfield Middle School we want all of our students to be confident in their ability to think mathematically. At each grade level we provide a range of instruction in order to meet students' individual differences. While most students are in grade-level classes using the *Math in Context* series of textbooks, some students are ready for an enrichment math class or an accelerated program. Others benefit from a slower pace and additional supports. The purpose here is to describe the range of our programs.

### **GRADE LEVEL PROGRAM: BRIDGES IN MATHEMATICS & MATH IN CONTEXT**

Our fifth graders use the Grade 5 *Bridges in Mathematics* textbook, concluding the math series they have used in elementary school. *Bridges in Mathematics* is a comprehensive K-5 mathematics program designed to meet national and state mathematics standards. The series is based on research about how children learn mathematics. The books focus on conceptual understanding of mathematics and the development of efficient strategies for problem solving. Students solve age-appropriate problems as they hone their mathematical thinking and develop their reasoning abilities.

*Math in Context* is the title of the series of math textbooks used by most of our students in Grades 6-8. We have used the *Math in Context* series since 1999. These books are different in appearance and approach from the math books that most adults used when they were in school. We have found that our students have a better understanding of mathematical concepts and of mathematical problem solving because of the approach that these books take.

The *Math in Context* program provides students with a rich foundation of pre-algebra and beginning algebra and geometry concepts and activities. The curriculum places a strong emphasis on making connections in mathematics. Students encounter rich mathematical problems that focus on concepts and connections among mathematical ideas. Students are challenged to develop their own solutions to problems and to explain their solutions through written and oral conversations. This program fosters the idea that math is a set of relationships

between concepts, facts and procedures. These relationships challenge students to look at math problems from a variety of approaches.

The *Math in Context* program develops students' problem-solving strategies as it introduces them to algebraic thinking. The content includes fractions, basic operations, decimals, number theory, graphing, equations, ratio/proportion, percent, geometry, probability and statistics.

In Grades 5, 6, 7 and 8 students develop their problem solving abilities with units each year focusing on number sense, geometry, algebra and statistics. As students progress through the *Math in Context* curriculum, the emphasis shifts from arithmetic and number sense toward more abstract algebraic thinking. Along the way, students gain the skills required for the transition to algebra.

Our students annually take the Connecticut Mastery Test, which provides information about each student's performance in over twenty math skills. Students whose scores are deficient in a skill area are provided with remedial work in that area. Our goal is for each student to achieve mastery – and confidence – in all of these essential math skills.

### **ACCELERATION: MATH PLUS**

For many years our staff has worked to find more ways to challenge our most able math students. Our vision is to accelerate the progress of those students who are able to meet the highest standards in math, in a program that we call *Math Plus*. This group will study the pre-algebra curriculum in Grade 6 and then take the formal high school algebra course, Math I, in seventh grade. These students go on to study geometry in eighth grade.

Please know that of more than sixteen thousand school districts in the United States, only a few accelerate whole classes to algebra in grade seven. From looking at the success rate of the students we select for *Math Plus* in their high school math programs, we know that we can successfully accelerate a class of math students in this way each year.

Based on a child's test scores and on teacher assessment of student classroom performance and task commitment, each year we select candidates for this fast-paced class. As in all classes, each student's commitment to working hard in this class is critical to being successful in the program. This is where we rely on parents' help.

- **COMMITMENT TO MATHEMATICS THROUGH HIGH SCHOOL.** *Math Plus* enables students to progress at an advanced level in math through high school. Since this class is TWO full years above grade level, consistent extra effort is needed for the advantage to be gained in grades 11 and 12. These students will then be eligible for two years of college math (e.g., calculus, statistics) before the end of high school. Anything short of a sustained commitment to the highest level of math achievement will result in a student's placement in a less accelerated level. We expect the students we select for this program to master algebra and geometry by the end of eighth grade.

This is an accelerated program for high achievers who love math and are excited about diving into difficult and challenging problems. It is a program for students who have **already** shown an extraordinary level of task commitment and effort in their math work. All students will still be required to take at least four years of math after they get to high school; as a result they would take calculus in eleventh grade and Calculus II or a similar course in twelfth grade.

If you are concerned about the commitment and pace that *Math Plus* requires, there is another accelerated math program at MMS to keep in mind. That program –

offering algebra in Grade 8 – will serve the needs of students who have potential, but have not yet demonstrated extraordinary task commitment. It is also the better choice for students who need further skill development. Children are selected for participation in that program at the end of seventh grade. (See the description of Grade 8 algebra below.)

- **CLOSE COMMUNICATION AMONG THE TEACHER, STUDENT, AND PARENTS**  
We need to keep close contact with you regarding your child's progress. We want to challenge, but not frustrate, our students. *Your child needs to know that moving to the other group would not indicate a "failure" of any kind.*
- **SUPPORT** We ask you to support our efforts to provide extra time for concepts your children may find difficult. There will most certainly be more homework in this math class in comparison with other math classes. X-blocks and after-school time are available for teachers to work with these students as well as to create a collaborative environment for the students to work together. Perhaps you can help us in ways we have not yet anticipated. We need to work together on this. Thus far, students and parents report that homework has not been a big problem. High school teachers expect very independent performance at these levels.
- **EMPHASIS ON THE LOVE FOR MATHEMATICS** We need you to help us emphasize that higher math courses are for those with interests in all fields, not just for future mathematicians. Many new careers beyond the sciences demand mathematical thinking. We want to include girls and boys, and we want future English and history majors to be as much a part of this effort as future chemists and statisticians. Students coming into *Math Plus* already love math, and that feeling for math deepens as their knowledge develops.

Students in *Math Plus* will be challenged more than they have ever been. You need to know that a student who changes from this class after the course begins could require a significant schedule change. Therefore, we do not encourage students just to "try" it. For the students we recommend for this program, we want their absolute best effort, and we believe they can do it!

We select students for the accelerated *Math Plus* program, considering these criteria:

- Performance in Grade 5 math and math enrichment lessons
- Performance on most recent CMT
- Performance on a test of pre-algebra concepts
- Teacher recommendation (an assessment of the student's achievement in class, independence, and confidence)
- Clear evidence of task commitment (assignments completed on time, attentiveness during class, interest in mathematics)

#### **"TYPICAL" ACCELERATION: Algebra I in Grade 8**

Students not selected for *Math Plus* may be considered for an accelerated program that will begin with Algebra I in Grade 8. This acceleration is "typical" in this sense: Most public middle schools in Connecticut offer algebra in Grade 8 to their accelerated math students. This program follows the high school Math I curriculum. The emphasis in this course is on linear, quadratic and exponential functions. Problem solving and the use of technology are key components of this course.

We have found that our *Math in Context* program in Grades 6 and 7 provides an excellent “pre-algebra” foundation for Grade 8 algebra.

We select students for this accelerated program at the end of Grade 7, based on these criteria:

- A standardized algebra readiness assessment (*Orleans Hanna*)
- A diagnostic math skills test, taken from the high school algebra series
- Performance on most recent CMT
- Teacher recommendation (an assessment of the student’s confidence, independence and achievement in class)
- Clear evidence of task commitment (assignments completed on time, attentiveness during class, interest in mathematics)

### **MATH ENRICHMENT FOR STUDENTS IN ALL GRADES**

All students are encouraged to explore their questions about mathematics topics with their classroom teachers or Mr. Perkins, the math/science enrichment teacher. Students who love to explore the possibilities of mathematical problem solving are invited to participate in the MMS *Math Counts* team. The team meets regularly after school to learn and share advanced problem solving strategies and to compete with students from other schools.

### **REMEDIAL INSTRUCTION: Title I Math**

We want all of our students to develop confidence in both their knowledge of math fundamentals and in their ability to solve problems. We regularly review each student’s classroom progress as well as annual scores on the 25 math objectives assessed on the Connecticut Mastery Test (CMT). Based on these reviews of students’ progress, math teachers and Title I teachers provide individual and small group remedial instruction to address the particular needs of each student. Our summer school program provides additional opportunities for building confidence with math skills and problem solving.

### **SPECIAL EDUCATION MATH INSTRUCTION**

Students who have been identified as needing special education services in mathematics receive that instruction from a special education teacher individually or in a small group, according to the Individualized Educational Plan (IEP) developed by the student’s Planning and Placement Team (PPT).

### **YOUR QUESTIONS AND CONCERNS**

If you would like to discuss your child’s math placement, please begin with this year’s math teacher, enrichment teacher, Title I teacher, and/or special education teacher. If you have further questions, please contact your child’s guidance counselor (Mrs. Melody for last names A-K, Mrs. Lee for last names L-Z).