

Bedford Public Schools

Mathematics Program Evaluation

Report of the Visiting Team

and

Action Plan

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Note: the Visiting Team Report and Action Plan have been combined in one document for convenience. Specific Action Items are included in the Findings and Recommendations tables from the Visiting Team report.

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Report of the Mathematics Visiting Team

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Introduction

The Visiting Team was invited by Superintendent Maureen LaCroix to visit the Bedford Public Schools on February 5 through 7, 2008. This was the second step in the three-part Program Review Process (PRP) described in the *Bedford Schools Guidelines for Program Review*, which began with a Self-Study and culminates in an Action Plan. Our efforts were guided by the eleven Essential Questions identified in the Self-Study:

Essential Questions

System-wide Issues

- 1) How can we address the problem of subgroups scoring below benchmark?
- 2) How can we improve communication among teachers at the grades 2-3, 5-6, and 8-9 transition points?

Elementary School Issues

- 3) We feel that the Number Sense strand is the "glue" that helps to integrate understanding in all the strands. To what extent is this reflected in our instruction? Are we doing enough?
- 4) How can we provide help for struggling students, including those who have not been identified as SPED? In addition, is there a math program that would be better suited to meet the needs of the students who are in the parallel math program?

Middle School Issues

- 5) Are we taking appropriate steps to improve the JGMS mathematics program?

High School Issues

- 6) How can we improve our process for assigning placements?
- 7) Should we seek greater consistency in high school assessments?
- 8) How can we teach to all the frameworks called for in the level 3 and level 4 curricula?
- 9) How can we achieve more effective differentiation of instruction in levels 3 and 4 at the high school?
- 10) How well does curriculum and instruction make mathematics authentic for students?
- 11) How well is the math program promoting/meeting the school-wide expectations in our new mission statement?

During the visit, we observed classes and interviewed groups of parents, teachers, students, administrators, and SPED/math support staff. In all of these activities, our first priority was to gather evidence and make recommendations pertinent to the Essential Questions. These are presented in the “Findings and Recommendations” section. The benchmarks guiding our judgments were the *NCTM Principals and Standards for School Mathematics* and the *Massachusetts Mathematics Curriculum Framework*.

Commendations and Summary Recommendations

System-Wide

We want to emphasize at the outset that the Bedford Public Schools mathematics program is effective and healthy. In all of the observations and interviews the Visiting Team conducted, we encountered talented and committed teachers, administrators, and support staff. The curriculum at all levels is a thoughtful, dynamic work in progress, in good alignment with the Massachusetts State Curriculum Frameworks.

Schools are manifestly well run. Everywhere we went, we found a calm, orderly, and purposeful atmosphere. The physical plant, comprising four modern, comfortable, and well-equipped schools, is exemplary.

We were impressed by the openness to scrutiny exhibited by the staff at every level. The Self-Study documents an extensive process of self-reflection; we saw signs that this process in itself has already led to improvements. This is a system that is actively engaged in making an excellent mathematics program even better.

We found that the biggest problem facing the mathematics program system-wide is coordination: there is very little communication among the programs at the elementary, middle, and high school. With a new program likely to be adopted at the middle school, a recommended exploration of standards-based methods at the high school, and a new program administrator to begin in September, we feel that the need for K-12 coordination is particularly pressing at the present time. Support from the central administration will play a crucial role over the next few years in providing support for this coordination, as well as for the developments which will be taking place at JGMS and BHS.

Davis and Lane Schools

The K-5 curriculum is comprehensive, NCTM Standards-based, and in good alignment with the state frameworks. The Self-Study documents a process in recent years of strengthening the curriculum by: 1) replacing Everyday Mathematics with Bridges in Math in grades K-1; 2) supplementing the Grade 2 Everyday Mathematics with the Number Corner component of the Bridges in Mathematics program; and, 3) supplementing the Everyday Mathematics curriculum in grades 3-5 to support the differentiation of instruction. Current curriculum materials are collected in the excellent Curriculum Sampling Binders, provided to every teacher.

Regular Elementary Steering Team meetings enhance communications among K-5 staff and contribute to a relatively high level of consistency in the K-5 program.

The coherence and dynamism of the K-5 program are largely due to the leadership of the curriculum coordinator, who clearly enjoys the admiration and respect of the staff. This individual is also responsible for an exemplary gifted and talented program.

While we had no major recommendations for the K-5 program, there are suggestions for improvement, detailed in the *Findings, Recommendations, and Action Items* tables.

John Glenn Middle School

John Glenn Middle School has a talented staff of math teachers, committed to standards-based mathematics curriculum and instruction. There are effective programs in place to support differentiation of instruction to students at both ends of the spectrum. The University of Chicago School Mathematics Project (UCMSP) Algebra course provides solid preparation to Level 1 8th graders. However, JGMS has grappled with problems associated with the Connected Mathematic Project (CMP), the curriculum for grades 6 and 7 and for Level 2 8th graders. The Visiting Team was impressed by the openness and resolve exhibited by the principal, program administrator, and teaching staff in addressing these difficulties.

While the CMP program is a well-regarded curriculum buttressed by research, the Self-Study documents ample evidence that it has not achieved adequate success at JGMS. There are several reasons for this—most notably that the program is designed for 60-minute periods, while JGMS currently has 41-minute periods. While teachers at JGMS

support the use of standards-based methods (e.g., inquiry-based instruction and regular use of technology) they have become dissatisfied with CMP and have replaced that curriculum in places with supplementary materials, mostly to ensure readiness for the MCAS test. While this is an appropriate response to a curriculum viewed as inadequate, the result is a curriculum lacking in overall coherence and with a reduction in standards-based pedagogy.

At this writing, the administration and JGMS staff are considering whether to replace CMP or to take steps to make that curriculum work. It is crucial that this process be carried out in a thorough, unhurried fashion; it may not be possible to reach a final decision in time for implementation this September, in which case an interim plan will need to be adopted.

We see a need for augmented administrative support during this transition. The new program administrator will have his/her hands full in supervising several new staff members, managing the NEASC process, and (if this recommendation is adopted) leading the BHS staff in identifying common practices. The augmented support could take the form of release time for the coordinator(s) at JGMS, an additional staff member hired on a temporary basis, or a reallocation of the duties of an existing administrator.

Bedford High School

The mathematics program at the high school has an experienced, talented staff with superior qualifications. The program administrator is a thoughtful, strong leader who enjoys the trust and respect of the entire system; we repeatedly heard expressions of regret that he is retiring. His loss must be regarded as one of the major challenges the program faces as it moves forward.

The high school curriculum is wide and deep, providing good choices for every ability level. The program has demonstrated success in superior MCAS, SAT, and AP scores. There are effective programs in place both for gifted students and students needing support. Modifications to the curriculum in recent years—such as the continuing and intensive sequences—exhibit the department’s commitment to providing access to all students as well as pathways for moving to more challenging courses.

The curricula and instructional practices at BHS are predominately “traditional”; that is, classes are mostly teacher-centered, based on lecture and explanation. There is sporadic use of technology concentrated largely in upper-level courses, and real-world applications are not strongly emphasized. While the program has achieved commendable success, we believe that traditional approaches alone will not address the concerns identified in the Essential Questions.

Some systems have replaced their entire curriculum with one of the comprehensive standards-based curricula, such as IMP or Core-Plus. At BHS, this would have the support neither of the staff nor of the parent community. Furthermore, adopting one of these curricula as an alternative for some students (e.g., in level 3 and 4 classes) would

not only exacerbate the problems associated with assigning and changing levels, but would pose onerous scheduling difficulties in a school the size of BHS.

The alternative—which we strongly recommend—is for the department to begin a process of identifying and establishing standards-based departmental common practices that build on the strengths of the program while responding to the Essential Questions. Such a process would require substantial meeting and workshop time devoted to discussion and professional development.

The difficulty of this process should not be underestimated. Adopting new methods may entail difficult trade-offs, such as reducing the scope of some courses. Nevertheless, we do not see another way to address the Essential Questions identified for Bedford High School.

Bedford Public Schools

Mathematics Program Evaluation: Action Plan

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In the first two steps of the mathematics program review process—the Self-Study and the Site Visit—we sought data, feedback, and recommendations from a range of sources: parents, students, teachers, administrators, internal and external assessment data, and the perspectives and observations of outside educators. In this Action Plan, the third and final step, our objective is to integrate what we have gathered into a coherent and feasible plan for improving the Bedford Schools mathematics program.

System-wide

We accept the recommendations of the Visiting Team for addressing Essential Questions #1 and #2, and have specified Action Items to respond to these recommendations (*pp. 11,12.*)

Elementary Schools

We accept the recommendations of the Visiting Team for addressing Essential Question #4, and have specified Action Items to respond to these recommendations (*pp. 12,13.*)

JGMS

We accept the recommendations of the Visiting Team for addressing Essential Questions #5, and have specified Action Items to respond to these recommendations (*pp. 14.*)

Although we are currently reviewing promising new curricula, it is doubtful that we will be ready to implement one of them by September, 2008. The establishment of a successful curriculum at JGMS—either a new one or an improved implementation CMP—will depend upon three key ingredients: 1) summer workshop time for professional development; 2) augmented administrative support; and, 3) improved coordination with the elementary and high school programs.

High School

We accept the recommendations of the Visiting Team for addressing Essential Question #6, and have specified Action Items to respond to these recommendations (p. 15.)

The recommendations addressing Essential Questions #7 through #11 (pp. 16-18) are closely related, and can be summarized this way:

Establish departmental common practices for assessments and for the increased use of technology, authentic instruction, and inquiry-based instruction.

We accept this recommendation in principle, but want to emphasize that achieving it will be a lengthy process—particularly with the upcoming NEASC evaluation taking up much of our time. As the use of these methods is time-consuming, the scopes of some courses may need to be reduced.

We propose the following three-year timeline:

Year 1: *discussion and information-gathering.* Reach tentative answers to questions: what does “authentic” mean for mathematics instruction? What technology, real-world applications, and inquiry-based methods hold out promise for the BHS program? Provide training in promising methods to the department, or to individual teachers who will report back to the department. Establish common practices which are “low-hanging fruit”—that is, ones which achieve early consensus and do not require extensive training.

Year 2: *piloting and evaluation.* Individual teachers pilot promising methods and report results to the department. Identify some common practices for adoption in Year 3.

Year 3: *establishing common practices.* Complete evaluations of pilots. Establish common practices for department-wide implementation in Year 4.

At the end of three years (i.e., by June, 2011) our goal will be to have established common practices to respond to each of the recommendations related to Essential Questions #7-#11. However, the process will not be finished, as practices may prove to be less successful than anticipated and we may become aware of other promising practices. A key component of our Action Plan is the establishment of an ongoing process for the evaluation and modification of departmental common practices.

Essential Questions- Findings, Recommendations, and Action Items

The parenthetical notes following each observation indicate the source:

CO = classroom observations
SI = student interview
PI = parent interview
TI = teacher interview
FI = facilitation team interview
SSI = SPED/math support interview
AI = central administration interview
CH = curriculum history
CD = curriculum documentation
SS = student survey
PS = parent survey
TS = teacher survey
AD = assessment data
VT = visiting team