Mathematics Curricula Review K-8

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Agenda

- Historical review
- Evaluation process
- Evaluation components
  - Instructional systems
  - Organizational systems
  - Quality of the Work of the Student
- Findings
- Action steps

Historical Review

- Fall 1999 – Math Task Force formed to review K-10 mathematics programs
- January - April 2000 – K-10 teachers review/pilot standards-based programs
- May 2000- Adoption of standards-based program
- May 2000 – School Committee presentation
- Summer 2000 – professional development
- September 2000
  - Letter and district newsletter – re: standards-based mathematics programs
  - Parent Math Nights scheduled

Historical Review

- **September 2000**
  - District mathematics adoption –
    - K-4 *Investigations in Number, Data and Space*,
    - 5-8 *Connected Mathematics Program* (CMP),
    - 9-10 *Discovering* series
- **Progressive implementation**
  - 2000-2003 – programs implemented incrementally
  - Fall 2003
    - Full implementation of Investigations K-4 – pacing guides aligned to MA Frameworks
    - 3 levels instituted for grades 7, 8: Grade 8 - Algebra honors and Algebra, level 2 – CMP
    - Realigned grade 5 program to Investigations, grade 6 full implementation of CMP
- **Curricula support positions**
  - Fall 2000 – K-5 Mathematics Curriculum Coordinator hired
  - Fall 2003 – Middle School Mathematics Department Chair(s) hired

Evaluation Process

- Fall 2006
  - Mathematics Curricula Review Team convened
    - Reviewed National Study of School Evaluation (NSSE) guidelines
    - Developed and facilitated
      - Teacher, student, parent, administrator surveys
      - Parent and administrator focus groups

Evaluation Indicators
(NSSE guidelines)

- Instructional systems
  - Curriculum
  - Instruction
  - Assessment
- Organizational systems
  - Leadership
  - Professional Development
- Quality of the Work of the Students

Instructional Systems

- **Curriculum**
  - To what extent is an organized, articulated, up-to-date curriculum in place?
    - Indicators
      - curricula aligned with frameworks
      - vertical and horizontal alignment
      - curricula documents accessible, used and current
      - curricula materials current and representative of articulated curriculum

Instructional Systems

- **Trends noted – Curriculum**
  - Inconsistent interpretation and implementation of the standards/benchmarks
  - Aligned curricula documents - horizontally and vertically
  - Inconsistent teacher use of the curricula materials, inclusive of purchased programs and teacher-created materials
  - Articulated need to provide a balance of traditional and constructivist mathematics.
  - Inconsistent teacher/parent communication

Instructional Systems

- **Action steps - Curriculum**
  - Provide format to follow the pacing guide as outlined in the curriculum guide
  - Develop consistent usage of curricula resources, inclusive of the mathematical programs and additional resources
  - Build consistency regarding automaticity of number sense and operations

Instructional Systems

- **Action steps – Curriculum (continued)**
  - Educate families regarding mathematical programs and standards
  - Increase parent communication – inclusive of newsletter, webpage, parent math nights, articulation of standards and placement process for middle school
  - Update website for relevant information
  - Improve the use of technology integrated into the curriculum

Instructional Systems

- **Instruction**
  - To what extent are research-based, best instructional practices being implemented?
    - Indicators
      - Instruction aligned with curriculum
      - Instruction employs data-driven decision making
      - Instruction engages student learning
      - Instructional support available for all students
      - Varied instructional strategies employed
      - Instruction promotes self-directed learning

Instructional Systems

- **Trends noted - Instruction**
  - Need assurance as to the consistency in use of curricula documents and resources.
  - More professional development and colleague collaboration needed
  - Increased opportunities for teachers to analyze the data of student learning assessments to inform instruction
  - Increased opportunities to provide learning experiences for all students
  - Increased use of technology articulated from parents and teachers.

Instructional Systems

- **Action steps - Instruction**
  - Provide teachers with data-driven decision making opportunities
  - Increased opportunities to allow all students to be appropriately challenged
  - Increased opportunities to use varied instructional strategies to meet the needs of all students
  - Increased teacher training to align instructional practices with current best practices

Instructional Systems

- **Assessment**
  - To what extent are assessments that reflect student learning goals in place, being implemented, and used to inform instruction?

Instructional Systems

- **Trends noted - Assessment**
  - Continued focus on creating more common assessments as was noted in the **Instruction** section
  - Opportunities for teachers to use the assessment data to inform instruction
  - Articulate the learning of students to families

Instructional Systems

- **Action steps – Assessment**
  - Develop more teacher-created common assessments
  - Administer the assessment(s) more consistently across the school/district
  - Continue the use of the Looking at Student Work and Planning protocol to assure consistency in administration and interpretation of the assessments
  - Use the data from assessments to inform instruction and progress toward student learning
  - Use the results of the assessments to assist students and parents in understanding student attainment of stated standards
  - Implement standards-based report of student progress, K-4, and standards-based progress report, 5-8

Organizational Systems

- **Leadership**
  - To what extent is there leadership in place that ensures skillful management of the program, operations, and resources that promote an effective learning environment?
    - Indicators
      - monitors progress
      - promotes continuous reflection on practice and student achievement
      - actively supports teaching and learning
      - promotes and plans for continuous improvement in student achievement

Organizational Systems

- **Trends noted – Leadership**
  - Adequate leadership for mathematics at the building level
  - Articulated need for more useful feedback on instructional practices

Organizational Systems

- **Action steps – Leadership**
  - Assure that leaders are supervising teachers in implementing the articulated curricula and using data to inform student acquisition of learning standards

Organizational Systems

- **Professional Development**
  - To what extent is there a focus on improving teacher skills and capacity to implement the articulated curriculum?
    - Indicators
      - Teachers have content and pedagogical knowledge to implement the curriculum
      - Teachers participate in professional development offerings
      - Professional development insures teachers have content knowledge and pedagogical skills
      - Professional development provides conditions that support productive change and continuous improvement

Organizational Systems

- **Trends noted – Professional Development**
  - Preferred mode for professional development was with the curricula leader
  - Need indicated for more content-focused courses coupled with instructional strategies to meet the needs of all learners
  - Articulated guidelines for professional development for teachers new-to-Natick

Organizational Systems

- **Action steps – Professional Development**
  - Continue to offer mathematical content courses (e.g., Making the Case, DMI 1 and 11, Annenberg courses, study groups)
  - Use the district early release professional development time to support mathematics
  - Develop in-district new teacher orientation to the mathematics curricula and resources

Quality of the Work of the Students

- To what extent do students meet or exceed benchmark expectations of curriculum essentials in the subject are under investigation?

Quality of the Work of the Students

- **Trends noted**
- Analysis of data reports
  - TerraNova and MCAS indicate a strong understanding of number sense; patterns, relations and algebra; and data, statistics and probability with at least 70% of our students scoring proficiently.
  - Areas of concern include geometry and measurement on the MCAS, where scores fluctuated between grade levels and years studied. However, geometry and measurement were not indicated on the TerraNova as an area of concern.
  - During the 2007 school year, data collection will include mid- and end-of-year benchmark assessments.

Summary

- Review of the indicators of school quality provided an opportunity for the Natick Public Schools to reflect on the teaching and learning of mathematics for our students
- Unique opportunity to highlight next steps to assure a consistent, comprehensive approach to mathematics for the district, schools, and teachers.
- The indicators – an organized, articulated, and executed curriculum; research-based and implemented best instructional practices; formative and summative assessments that reflect student learning goals; organizational systems that support these aspects of student learning; and professional development opportunities that work in concert to assure teacher understanding and implementation of these stated indicators will serve to support substantive student learning.

Next steps

- Convene grade level teams/curriculum coordinators to:
  - Devise a plan for consistency in and use of curricula documents
  - Develop common assessments
  - Use data from all assessments to inform instruction
  - Provide professional development in content, pedagogy, and sound instructional practices