

School Board Meeting:

March 14, 2016

Subject:

Math REFLECT Report

Presenter:

**Pam Miller, Rob Nosbush and
Stacy Eggers**

SUGGESTED SCHOOL BOARD ACTION:

Report only.

DESCRIPTION:

The district's continuous improvement process includes seven different phases designed to assist all programs in developing and refining excellence for the students of BHM Schools. Those phases are REFLECT, RESEARCH, PILOT, IMPLEMENT, ADJUST, REFINE, and EVALUATE.

Each phase of the process identifies specific desired outcomes and related tasks to achieve those outcomes for the program to be prepared to continue to the next phase of improvement. There are two opportunities within the Continuous Improvement Process (CIP) for the programs to prepare and present information to the school board either as reports or as recommendations for program improvement proposals.

The Math program is currently completing the phase of REFLECT. During this time, licensed staff examine program strengths and limitations and current research in the field, as well as revised state or national standards. This research of best practice, along with the examination of current strengths and program limitations, then helps to formulate a recommended program improvement action plan for the next phase of the continuous improvement process.

At Monday's board workshop, representatives of the Math program will be sharing a summary of the strengths and limitations they have discovered through the REFLECT phase.



K-12 MATHEMATICS PROGRAM

REFLECT REPORT
2015-2016

BACKGROUND INFORMATION

Elementary students receive a minimum of 60 minutes of daily math instruction. In most elementary sites, an additional 15 minutes of math intervention/enrichment time is built into the instructional schedule. The enVisions math program was adopted in 2010. This program is used as the core resource in grades K-5. The Quest program also uses enVisions math program in grades 2-5, however, students are accelerated and using above grade level standards. The enVisions lessons typically begin with a problem of the day or a spiral review. Problem-based interactive learning is used as a “Hand on-Minds on,” approach to learning. Most teachers use visuals, such as online movies, as a bridge to learning. Lessons continue with guided practice and independent practice. Formative assessments in the form of Quick checks typically close the lessons. Supplemental resources are used to meet state standards in areas where the enVisions resources do not.

At BCMS, students have 53 minutes of math each day for the entire school year. At the high school, students have 80 minutes of math for half of the school year. Some students elect to “double up” in math and take two math courses in one year so that they have math all year long. Other students have math for only half of the year.

Our team of secondary math teachers consists of 21 teachers dedicated to helping students succeed; 10 at Buffalo Community Middle School (BCMS) and 11 at Buffalo High School (BHS). BCMS offers 6th, 7th and 8th grade math classes that are aligned to the Minnesota Academic Standards in Mathematics. To meet the needs of all

students, we have options for both our students needing support as well as our students needing a challenge.

Students in the BHM Quest program are accelerated at least one year and there are enriched math courses offered in grades 6-8. In addition to Quest and enriched classes to challenge students, BCMS offers a co-taught class at each grade level to support students with special education staff. BCMS also offers a math prime class that is an elective course for students to get extra support during the school day. Outside of school hours, BCMS students can participate in the math EDGE program. This is a program offered as additional math support for students who are at risk of not meeting the standards. Online games and resources are used to vary the instruction and provide support to students.

BHS continues the mathematical understanding of our students by offering the required three years of mathematics in Algebra 1.5, Geometry and Algebra 2 courses. Beyond the required courses, BHS offers trigonometry, pre-calculus, College In the Schools (CIS) College Algebra, Advanced Placement (AP) Statistics, AP Calculus AB, AP Calculus BC, Life Skills, and Statistics. Next year, BHS will be adding a CIS Finite Mathematics course. Our course offerings are frequently reviewed as a department to ensure that we have courses to meet the needs of our students. In addition to a wide variety of course options, there are co-taught classes to support students with special education staff. There are student mentors and tutors available to provide peer support both in classrooms as well as outside of the school day. Recently, we have also added additional after school support for students by having a math teacher available in the media center.

STANDARDS

The Minnesota state standards are used to guide instruction at all grade levels. In the Quest program, students are accelerated in math and are completing above grade level standards. The current set of standards was adopted in 2007. Though the math standards were scheduled to be reviewed again during the 2015-16 school year, the review has been postponed by the legislature. As passed in the spring 2015 first special

legislative session, according to Chapter 3, H.F. 1, the math standards review has been postponed until 2020-21.

[MN Math Standards Document](#)

[Link to Minnesota Department of Education Standards Information](#)

BHM EVIDENCE OF ACHIEVEMENT

The performance series test is given to students in grades 2-8. It is an adaptive online assessment which can be used to measure a student's growth over time. The test had been given in both fall and spring. Last year the middle school began only administering the test in the fall and using fall to fall growth comparisons. The elementary level is following suit this year.

The Minnesota Comprehensive Assessment is given once a year to students in grades 3-8 and once in grade 11. This assessment is a statewide test that is based on the standards for each grade level.

National Comparisons - [Performance Series Test - 3 Year Results](#)

State Comparisons - [MCA data - 5 year trend](#)

Local Comparisons - [MCA Neighboring Districts](#)

STATE AND NATIONAL TRENDS AND RESEARCH OF BEST PRACTICES

The mindset research of Stanford Psychologist Carol Dweck is being discussed and implemented across the state and nation. The idea of a growth mindset can be applied to people of all ages and both teachers and students in BHM schools are working with the belief that everyone can learn.

The Minnesota Department of Education (MDE) website states that "Minnesota has not adopted the Common Core mathematics standards. The academic standards are revised according to a timetable specified in state statute. The 2007 Minnesota K-12 Academic Standards in Mathematics were revised prior to the development of the Common Core mathematics standards... Minnesota is not a member of either of the two national testing consortia related to the Common Core standards, and has instead developed its own state assessments aligned to the standards."

BHM PROGRAM STRENGTHS

Students, Staff and Parents were surveyed with a variety of questions including the program strengths of the BHM elementary math program.

A mixed ability, mixed age student focus group was conducted at each elementary school. Overarching themes from these groups included that computation was an “easy” concept for all grade levels. Math games and centers were also listed as being enjoyed by all grades as ways of learning the various concepts.

Elementary staff members were also surveyed. 96% of the staff respondents rated themselves as comfortable or very comfortable using the materials for the program. The elementary math CIP team also noticed very high levels of teachers using each of the components on a regular basis although the program has been in use for six years. Seeing these results suggests that the integrity of the program is being upheld.

BHM has great teachers who care about their students was a theme seen in the Family Survey. 81% of families agreed or strongly agreed that their child enjoys math. 81% agreed or strongly agreed that the needs of their child were being met. 83% of parents responding felt that their child was being adequately prepared for the next grade level.

To get a glimpse into what people are thinking about math at the secondary level, we surveyed the parents, students and staff of BCMS and BHS. In all surveys, a strength that came through was the teachers. People were thankful for the effort, and availability and attitude of the teachers who are working with our students. Another strength that was commonly identified was communication. 91.6% of BCMS parents agreed or strongly agreed to the statement, “It is easy to communicate with my child’s math teacher.” With access to the parent portal, teacher websites, emails and phone calls, parents are feeling connected to what is happening in math.

The surveys gave insight to the level of difficulty students are experiencing in secondary math classes. The majority of our students and parents agreed that students are being challenged at the appropriate level (as can be seen in the following survey results).

BCMS Family Survey:

“I feel my child is learning new material and being challenged at the appropriate level.”

Value	Percent	Count
Strongly Agree	24.1%	40
Agree	60.8%	101
Disagree	12.1%	20
Strongly Disagree	3.0%	5
Total		166

BCMS Student Survey:

“Rate how well you are being challenged in math.”

Value	Percent	Count
0- not at all	3.2%	17
1- a little bit	15.6%	82
2- just right	60.6%	318
3- a little bit too difficult	18.3%	96
4- much too difficult	2.3%	12
Total		525

BHS Family Survey:

“To what degree do you feel your child is being challenged in their math courses?”

Value	Percent	Count
Not at all	1.6%	2
A little bit	12.9%	16
Just right	61.3%	76
Slightly too difficult	18.6%	23
Much too difficult	5.7%	7
Total		124

BHS Student Survey:

“To what degree do you feel challenged in your math courses?”

Value	Percent	Count
Not at all challenging	5.1%	14
Not quite challenging enough	10.6%	29
Just right	57.5%	157
A little too challenging	21.3%	58
Much too challenging	5.5%	15
Total		273

We also received information from parents and students by asking them to complete the following rankings:

3. Rank the following as EXCELLENT or GOOD or FAIR or POOR:

	EXCELLENT	GOOD	FAIR	POOR	Responses
Quality of math instruction	30.7 % 51	48.8 % 81	13.3 % 22	7.2 % 12	166
Adequate preparation from last year to this year	27.1 % 45	51.8 % 86	16.9 % 28	4.2 % 7	166
Teacher's concern for student learning in math	42.8 % 71	38.6 % 64	12.7 % 21	6.0 % 10	166
Quantity of math homework	24.7 % 41	51.8 % 86	18.1 % 30	5.4 % 9	166
Overall middle school math experience	25.3 % 42	44.6 % 74	19.9 % 33	10.2 % 17	166

BHM PROGRAM LIMITATIONS OR CHALLENGES

As part of a focus group, students were asked whether they preferred paper/pencil tests compared to computer tests - an almost unanimous response of preference toward paper/pencil was voiced. A challenge faced at BHM is that both the Performance Series and MCA tests are administered on computer.

From the elementary staff survey, teachers indicated a need for a variety of manipulatives outside of the ones provided along with the enVisions program.

Comments also suggested that there was an inconsistency of difficulty across grade

levels and units.

Elementary families suggested limitations of the math program might be the level of challenge. Although both sides of this debate were voiced, 20% of respondents rated the curriculum as too “easy” while only 8% mentioned it was too “hard.” Parents would also like more variety in enrichment opportunities in school and want something coming home to provide conversation to check-in with their child.

The third elementary stakeholder group was students. Although comments on a variety of topics were mentioned, the only theme which stood out over grade levels showed that students preferred paper/pencil tests over computer based testing. It is not clear however, the factors which affected this theme. MCA and Performance Series tests are computer based, however, they are longer compared to classroom assessments. The enVisions resources provide on-line assessment however only a small portion of teachers use that part regularly.

For secondary math students and their parents, time seemed to be an issue of concern. Block scheduling at BHS offers both opportunities and challenges to our students, particularly when it comes to math. Although the 80-minute block offers time for asking questions and exploring topics, the pace of getting through a year’s worth of math content in half of a year causes a challenge for some students. In addition to a challenging pace, the time between math courses can be an obstacle for some students. For example, a student may have math in the fall of their freshman year and then not have math again until the spring of their sophomore year. As a department, we are looking for ways to give students the time they need to be successful in math.

NEXT STEPS

As we move from the REFLECT phase into the RESEARCH phase of the Continuous Improvement Process, we will continue to research best practices, intervention options and look at what is happening around us.

It is important to continue clear communication with our students and their families at

both the elementary and secondary levels. The elementary CIP team will be looking at ways to communicate with parents about what is being done in classrooms to challenge students. The team will also be talking about ways to provide a conversation starter for families about math. BCMS is discussing ways to inform parents about the numerous resources available to both students and parents.

In an effort to help with the challenges of pacing and time between math courses that arise with block scheduling, BHS will be piloting an algebra 1.5 course that follows the A/B schedule used by some of our departments, such as music and physical education. The algebra 1.5 class will be paired with a science 9 course to go all year long and meet every other day.