

K-12 MATH  
PROGRAM  
EVALUATION

2021-2022



## K-12 Math Program Evaluation Committee

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## **Introduction**

Program evaluation is a means of accessing and organizing information about student achievement and the role current curriculum and instructional practices play in supporting that achievement, the results of which play a key role in evaluating the effectiveness of a school. As a learning community concerned with continuous improvement, Brighton Central School District utilizes its program evaluation process to establish the impact of its instructional practices on the overall development of its students. More than an audit, the evaluation uses pertinent data to assess the ongoing efforts to improve student learning. Every five years educators representing a specific content area evaluate that area for grades K-12 to gain a comprehensive view of the district-wide scholastic program. In addition to the ongoing annual reviews at individual grade levels, this in-depth study helps the district in its continued efforts to improve instruction. The data used in this evaluative process reveal areas of success as well as areas in need of attention.

The current Math program evaluation was initiated in the summer of 2021 and began with a review of the independent evaluation that was conducted in 2016 and district led evaluation conducted in 2014. Committee members felt that reviewing this previous work and updating the goals for the current program to meet state standards and expectations would result in the most comprehensive evaluation but still represent the work that was done previously. As with most evaluations, two separate dimensions were reviewed; the expectations for student achievement and the capacity of the organization to support the teachers who teach mathematics. Due to the COVID-19 pandemic, student learning was disrupted for two years, and traditional assessments were not given to students. For this reason, many student data points that may have typically been accessed and helpful in defining goals were not available.

## **Process**

The evaluation design was created with two objectives in mind:

- 1.) To evaluate the extent to which Brighton students achieve the goals of the K-12 Math program and meet local, state, and national standards.
- 2.) To evaluate the extent to which the district supports student achievement through curriculum development, instructional practices, and assessment alignment.

### ***Defining Program Goals and Outcomes for Student Achievement***

During its initial meeting the committee focused on defining the overall goals for the work for the school year. These goals stemmed from a review of previous work as well as input from all stakeholders involved in the program evaluation.

### Math Program Evaluation Goals:

1. To define what rigor looks like in math instruction including support for differentiation.
2. To review the impact our professional learning program has on instructional practices and student achievement.
3. To determine what culturally responsive instructional practices are being used in mathematics.
4. To determine how curricular changes have impacted student learning and achievement.
5. To develop an understanding of the opportunities in equity that students have to grow in math.

### **Defining Data Sets**

Once each of the goals were defined, decisions were made concerning which data elements would be the best measures for each of the areas. As stated earlier, it was the intent of the evaluation team to collect data from a variety of sources to better support any conclusions and subsequent recommendations that were developed. In addition to multiple data sets, the team also looked at multiple data types. Drawing from the work of Bernhardt (2004) and others, data reflected four main types: demographic, perception, achievement, and process data. These data were both quantitative and qualitative in nature and were thought to thoroughly measure the indicators identified for each dimension. The following data sets were utilized during this evaluation.

1. Surveys
  - Students (5<sup>th</sup>, 8<sup>th</sup> and 11<sup>th</sup> grade)
  - Teachers
2. NWEA MAP data
  - Review of data for 2<sup>nd</sup>, 5<sup>th</sup>, and 8<sup>th</sup> grade student subgroups – ELL, gender, race, IEP, 504, AIS services
3. Students who are in math acceleration
  - Review of current students in math acceleration at grades 3-8 in subgroups of race, gender, ENL, IEP, 504
4. BHS Course data
  - Demographics of students enrolled in EMCC
  - Demographics of students enrolled in the following classes over the past 3 years:
    - Discrete Math
    - AP Statistics
    - AP Comp Sci
    - AP Comp Sci Principles

**Data findings as organized by goals**

- **To define what rigor looks like in math instruction including support for differentiation.**
- **To determine how curricular changes have impacted student learning and achievement.**
  - What does a rigorous math classroom look like?

K-5	6-8	9-12
<ul style="list-style-type: none"> <li>• Learners challenged and engaged</li> <li>• Visible thinking</li> <li>• Explaining</li> <li>• Basic skills taught</li> <li>• Conceptual math taught</li> <li>• Application</li> <li>• Flexible problem solving</li> <li>• Perseverance</li> <li>• High expectations</li> <li>• Productive struggle</li> <li>• Collaboration</li> <li>• Math conversations</li> <li>• Real world application</li> <li>• Independence</li> <li>• Differentiated</li> </ul>	<ul style="list-style-type: none"> <li>• Learners challenged</li> <li>• Real world problems</li> <li>• Collaboration</li> <li>• Challenge</li> <li>• Multiple solutions</li> <li>• Engaged</li> <li>• Connections</li> <li>• Independence</li> <li>• Exploration</li> <li>• Inquiry</li> <li>• Differentiated</li> </ul>	<ul style="list-style-type: none"> <li>• Collaboratively learning</li> <li>• Productive struggle</li> <li>• Curious students</li> <li>• Inquiry</li> <li>• Make connections</li> <li>• Independence</li> <li>• Explaining</li> <li>• Perseverance</li> <li>• Problem solving</li> <li>• Real world</li> <li>• Multiple approaches</li> <li>• Challenged learners</li> <li>• Open ended questions</li> <li>• Engaged</li> </ul>

- What do you need to achieve the vision listed above?

K-5	6-8	9-12
<ul style="list-style-type: none"> <li>• Time to plan</li> <li>• Resources and games</li> <li>• Balanced math classes with student needs</li> <li>• Mental health supports</li> <li>• Flexibility with using program</li> <li>• More adults in the room</li> <li>• More class time</li> </ul>	<ul style="list-style-type: none"> <li>• Resources - differentiated</li> <li>• Curriculum training</li> <li>• Time to plan and collaborate</li> <li>• Support for struggling learners</li> <li>• More training/PD</li> <li>• More programs</li> <li>• Smaller classes</li> </ul>	<ul style="list-style-type: none"> <li>• Interpreting student learning</li> <li>• Time to plan and collaborate</li> <li>• More class time</li> <li>• PD</li> <li>• More open ended questions</li> <li>• Not being tied to the Regents</li> </ul>

- No one said that the current program meets all the needs of students in their classes. Most teachers shared that the program somewhat meets or meets the needs of their students. Some 1<sup>st</sup> and 6<sup>th</sup> grade teachers shared that the program did not meet their students' needs.
- About 50% of teachers shared that the math program offers an opportunity for differentiation and about 50% said it does not. See specifics by grade level band in chart below for needs noted in differentiation

K-5	6-8	9-12
<ul style="list-style-type: none"> <li>• Finding and creating supplemental materials</li> <li>• No time to practice skills in materials</li> <li>• Opportunities for higher level learners (i.e., 2<sup>nd</sup> grade students need more opportunities)</li> </ul>	<ul style="list-style-type: none"> <li>• Too much reading for Special Education students</li> <li>• Hard to make real life connections</li> </ul>	<ul style="list-style-type: none"> <li>• Some felt that differentiation was appropriate, an equal amount felt it was not.</li> <li>• Some points mentioned: No fluidity between honors classes, scheduling issues</li> </ul>

- Common theme – more supplemental materials are needed to support a variety of learners, more foundation skill building, training for all support teachers including AIS and SpEd teachers, need more common planning time to get the work done together.
- What do you need to support the wide range of learners in your classroom? Below are the largest noted themed items

K-5	6-8	9-12
More TA Support Smaller class size Supplemental materials*** More Training *** TIME to collaborate and build resources*** Readymade materials and manipulatives	(Combined with 9-12)	Access to resources and materials, whiteboards, manipulatives  TIME to plan, modify and work with a coach (biggest need identified)  Training for lower level differentiation

- To review the impact our professional learning program has on instructional practices and student achievement.**
  - 61% of teachers report having been trained in their current program, 20% said they have not been trained and 2% are unsure. Teachers who said they have not been trained are special education teachers and academic support instructors.
  - 43% of teachers requested additional training in their math program – an equal-ish amount in each building. 57% said that they do not need more training.
  - The majority of teachers shared that the current professional learning opportunities somewhat meet their needs or meet their needs. There were a few teachers at each level K-11 that shared that the professional learning barely or does not meet their needs.
  - 54% of teachers have attended math curriculum institutes in the summer, 46% have not. More 6-12 teachers have attended than K-5.
  - The best time to engage is professional learning – Superintendent’s Conference Day 37% and Summer 28%
  - Ideal math professional development looks like collaborative grade level time and diving deeper into understandings. It is also ongoing, includes model lessons and is focused on meeting the needs of a variety of students
  - Not many themes around how PD impacted math instructional practices – moreover a list of PD that teachers attended
  - Reasons why teachers did not attend PD: TOP REASON – not enough offered @ K-5, also noted that more training is needed for new teachers (at K-12 this was noted), also some teachers who do not directly teach math do not regularly attend math PD (i.e., SpEd teachers)
- To determine what culturally responsive instructional practices are being used in mathematics.**
  - Most used practices: Making Thinking Visible protocols, incorporating self-reflection and self-monitoring into lessons, using an inquiry approach to learning
  - Least used practices: explicitly embed Habits of Mind, using formalized classroom talk structures, mindful diversity in the classroom
  - Identified need: More PD on culturally responsive practices in math, diversity in content (overall)
  - What do you need to be more culturally responsive in your math classroom? See specific responses below.

K-5	6-8	9-12
<ul style="list-style-type: none"> <li>Smaller class size</li> <li>Content specific training</li> <li>Unsure</li> <li>Connect literature to EM4</li> <li>Resources</li> </ul>	<ul style="list-style-type: none"> <li>Not sure</li> <li>PD</li> <li>Time</li> <li>PD on students’ IEPs</li> <li>More diversity of content</li> <li>Updated curriculum</li> </ul>	<ul style="list-style-type: none"> <li>Math specific PD</li> <li>Time</li> <li>Different school structure</li> <li>Dig deeper</li> <li>Collaborate</li> <li>Unsure</li> </ul>

<ul style="list-style-type: none"> <li>• Time</li> <li>• Connect to students out of school experiences</li> <li>• PD</li> </ul>		
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- **To develop an understanding of the opportunities in equity that students have to grow in math.**

Results from student survey

5 <sup>th</sup> grade	8 <sup>th</sup> grade	11 <sup>th</sup> grade
<p>How do you feel about yourself as a mathematician?</p> <ul style="list-style-type: none"> <li>• All students in accelerated math rated 3/5 or higher</li> <li>• Most students fell in the “pretty good” range</li> </ul> <p>Describe a time you felt successful in math?</p> <ul style="list-style-type: none"> <li>• Most students reported being successful when they did well on a test, high grades, and scores in class – results did not vary based on demographics of students.</li> </ul> <p>Which part of math class do you enjoy?</p> <ul style="list-style-type: none"> <li>• Working with classmates, working on a project that you were interested in, and independent thinking and work time were most highly rated.</li> </ul>	<p>How do you feel about yourself as a mathematician?</p> <ul style="list-style-type: none"> <li>• More males selected 1-2 (very negative/not so great)</li> <li>• More females feel in the 3-5 range</li> </ul> <p>Describe a time you felt successful in math?</p> <ul style="list-style-type: none"> <li>• Accelerated math students felt more successful.</li> <li>• Good grades were highly mentioned as feeling successful as well as making connections, liking challenges and instant gratifications</li> </ul> <p>Which part of math class do you enjoy?</p> <ul style="list-style-type: none"> <li>• Working with classmates came in clearly as #1!</li> </ul> <p>Do you feel you are a valued part of your math classroom? Why or why not?</p> <ul style="list-style-type: none"> <li>• Feeling valued when</li> </ul>	<p>How do you feel about yourself as a mathematician?</p> <ul style="list-style-type: none"> <li>• Most students fell in the 3/4 range</li> <li>• All students of color fell in 3-5 range</li> </ul> <p>Describe a time you felt successful in math?</p> <ul style="list-style-type: none"> <li>• Grades came out overwhelmingly as biggest theme of being successful, second is understanding content and concepts</li> </ul> <p>Do you feel you are a valued part of your math classroom? Why or why not?</p> <ul style="list-style-type: none"> <li>• Discourse=value</li> <li>• Helping others is valuable as well as teachers who care about you</li> <li>• Being correct is important, group work and answering questions is valuable, teacher authority over student authority is valued</li> <li>• Most students</li> </ul>



<p>Do you feel you are a valued part of your math classroom? Why or why not?</p> <ul style="list-style-type: none"> <li>• There was a big part of being valued around teacher acknowledgment or raising their hands. If students raised their hands and were called on a lot, they felt valued, if they did not raise their hand or participate, they felt less valued. Also, value came from asking a lot of questions in class as well.</li> </ul>	<p>they feel they can contribute to the conversation</p> <ul style="list-style-type: none"> <li>• When students are independent learners, they do not feel as valued</li> <li>• Interact with other people – the social aspect is seen as valuable – being able to contribute to the conversation</li> </ul>	<p>reported being valued in math class with about 10% saying no or sometimes</p>
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### Recommendations

1. Develop a systematic approach to math specific professional learning including onboarding of new hires, updated program training for all teachers of mathematics including special education teachers and academic support instructors.
  - a. Including a large variety of professional learning opportunities such as book studies, professional learning teams, asynchronous, etc.
  - b. New hires and teachers that have transferred from buildings
2. Define and implement Culturally Responsive and Sustaining Education practices and Habits of Mind specific to math teaching and learning.
  - a. This includes but is not limited to grading practices, classroom talk practices, making thinking visible strategies, student voice, etc.
3. Continued review of math acceleration process
4. Identify or develop supplemental lessons for each grade level or course to provide additional differentiation for skills or content.
  - a. Common definition for differentiation to share with teams
5. Extend Everyday Math (EM4) curriculum to 6th grade

### Limitations

One of the primary limitations of this math program evaluation was noted in the lack of standardized data sets. Due to the COVID-19 pandemic, student learning was disrupted for two years, and traditional assessments were not given to students. For this reason, many student data points that may have typically been accessed and helpful in defining goals were not available.

## **References**

Bernhardt, V. (2004) Data analysis for continuous school improvement. Eye on Education. Larchmount, NY.