

## **BACKGROUND OF PROGRAMMING IN BHM SCHOOLS**

### **Buffalo High School**

Students are required to earn 3 credits of mathematics for graduation. Each 2 trimester course is worth 1 credit. For the majority of students, mathematics instruction at the high school begins with an Intermediate Algebra course which is differentiated for various readiness levels through layers of support. BHS strives to provide students with a self-directed and relevant learning path. There are also a variety of elective courses that students may choose upon the completion of Intermediate Algebra, Geometry, and Algebra 2 courses. These include a variety of opportunities for students to connect, collaborate, and communicate, as well as a chance to earn college credit in CIS (College in the Schools) courses or AP courses as well.

### **BHS Elective Math Courses:**

Algebra 3 with Trig  
CIS College Algebra  
Pre-Calculus  
Trigonometry  
Advanced Placement (AP) Calculus A/B  
Advanced Placement (AP) Calculus B/C  
Statistics  
CIS Statistics  
Intro to Computer Programming  
AP Computer Science  
Life Skills

## **PROGRAM STANDARDS**

**From the MDE Website:** “The *Minnesota K-12 Academic Standards in Mathematics* are grounded in the belief that all students can and should be mathematically proficient. All students need to learn important mathematical concepts, skills, and relationships with understanding. The standards describe a connected body of mathematical knowledge students learn through the processes of problem solving, reasoning and proof, communication, connections, and representation. The standards are grouped by strands: 1) Number and Operation; 2) Algebra; 3) Geometry and Measurement; and 4) Data Analysis and Probability.

[Current standards] were revised in 2007, with full implementation by the 2010-11 school year. Though the math standards were scheduled to be reviewed again during the 2015-16 school year, the review was postponed. As passed in the spring 2015 first legislative session, according to Chapter 3, H.F. 1, the math standards review was postponed until 2021-22.”

According to the Minnesota Department of Education, in accordance with Minnesota Statutes, “Minnesota’s academic standards are reviewed and revised on a 10-year cycle. During 2021-2022, the department facilitated a review of the Minnesota K-12 Academic Standards in Mathematics. The standards are being revised for Minnesota public schools, by Minnesotans. The Minnesota K-12 Academic Standards for Mathematics review and revision was being conducted by a committee that includes members with varying perspectives and backgrounds from across Minnesota. Minnesota Statutes outline who must be represented on the committee, including parents, currently licensed and in classroom teachers, licensed school administrators, school board members, post-secondary institution faculty teaching core subjects, and business community members.

It is still early in the statutory rulemaking phase of the standards review and revision process. There are multiple opportunities throughout this phase for the public to make comments and provide feedback on the proposed standards language and for changes to be considered and made to the initial proposed standards draft.

The next step of the statutory rulemaking process is that MDE will review the public comments submitted to the Office of Administrative Hearings (OAH) during the 60-day statutory public comment period. Next, MDE will draft the Statement of Need and Reasonableness (SONAR), which has traditionally taken 14-17 months. The full statutory rulemaking process can take up to 24 months.

The statutory rulemaking process for the Minnesota K-12 Academic Standards in Mathematics is not complete until the Notice of Adoption is published in the State Register. Each content area includes an implementation date in the adopted rule. If adopted, the proposed K-12 academic standards in mathematics will be implemented in the 2027-28 school year.”

## **SUMMARY OF PROCESS FOR REVIEW OF INSTRUCTIONAL RESOURCES**

### **Trigonometry**

In the early stages of the Trigonometry pilot, multiple resources were researched. The conclusion was that these resources would not be an improvement to the text being currently used. The foundational textbook, Algebra and Trigonometry for College Readiness by Margaret Lial is used currently in Algebra 3 with Trigonometry elective course. This resource is paired with the digital platform MathXL. The Algebra 3 course has a brief introduction to Trigonometry, where the Trigonometry course goes into great detail and covers the topics needed to prepare students for more advanced courses such as calculus. Since the structure and pacing of the Lial resource has been well-liked by both teachers and students, it became obvious that the best choice for the pilot in Trigonometry would be to use the Lial book and pair it with MathXL.

During Trimester 1, the Lial book was piloted and MathXL was used for homework. The ability to use the chapters not included in the Algebra 3 course was the best option. The MathXL program pairs as a formative assessment tool. Students are able to practice problems and receive immediate feedback. They were given unlimited opportunities to continue to retry problems they may be struggling with. They are also able to access similar examples, hints, explanations, calculators, and PDFs of the book all in the MathXL program to give them support to work through their individual work. It has been a positive self assessment tool before moving on to summative assessment. The digital component allows for implementation of technology into the classroom and college readiness. Many universities use MathXL or similar programs when assessing students.

The overall piloting process has allowed a deeper dive into a current curriculum that is currently used for Algebra 3. The Lial book as a resource for Trigonometry will allow better alignment with the Algebra 3 and Trigonometry elective courses with the same curriculum structure. Algebra 3 will conclude right where Trigonometry will begin. The use of the digital platform of MathXL will allow students to better self-assess their own learning while preparing them for universities who use similar programs. There are many exciting potential improvements that using these resources can bring for student achievement and alignment of math department courses.

### **Financial Algebra**

Financial Algebra, formerly known as Lifeskills Mathematics, deals with the various types of everyday math situations that one must cope with upon graduation from high school. Topics include review of basic math operations, personal banking, loans, metric and English measurements, automobiles and transportation, housing, insurance, budgeting, income and deductions, and careers. This is an elective course, aimed to support students in their post-graduate outcomes.

Prior to the pilot, the course utilized was an earlier edition of Financial Algebra from Cengage.

The team discussed and piloted two different resources. One, Savvas' Business Math and Cengage's most recent edition of Financial Algebra. While both are reputable, the team decided to move forward with the adoption of Cengage's Financial Algebra: 2nd Edition. The program utilizes both a textbook and workbook which have been very beneficial for students and the teacher. This particular course works to support students who may need an alternative course of study or elective for graduation; the Cengage text supports this.

The program supports differentiation and learning styles, allowing for student mastery and teacher autonomy.

## **RECOMMENDATIONS**

### **Algebra 3**

Algebra & Trigonometry for College Applications

Teacher Edition (2), Textbooks (25), Digital Access (120 licenses)

### **Financial Algebra**

Cengage - Financial Algebra: Advanced Algebra with Financial Applications: 2nd Edition  
Teacher Edition, Digital access

These programs accommodate different learning and teaching styles, allowing for student mastery as well as teacher fidelity and autonomy. Lessons have digital and hard copy extensions and resources to provide additional learning opportunities for both intervention and enrichment.

### **FINANCIAL IMPLICATIONS**

Trigonometry	\$21,762
Financial Algebra	\$ 7,542

Detailed information on the financial impact is here: [Math CAP Resource Spreadsheet 23 + 24](#)

### **NEXT STEPS**

- Timeline for purchase
  - After July 1, 2024.
  
- Professional Development needs or Preparation for Use
  - Summer Curriculum Writing Planning Time
  - Spring / Fall Professional Development
  - Implementation CIP days
  - Elective course adoption for 2025-2026 school year
    - Pre-Calculus
    - Calculus