

# **PROGRAM EVALUATION**

## **Southern Boone County R-1 Schools**

**Program Evaluated:** Mathematics

**Date Submitted to the Board of Education:** May 29, 2018

**Person(s) Responsible:** Karen Himmelberg, Jasmine Rustemeyer, Erin Sappington, Kristin Catron, Monica Wilkerson, Jessica Scheidt, Michelle Wilson, Jennifer Jenkins, Carol Bange, Emily Becker, Ashley Van Black, Lisa Levery, Alex Mertzlufft, Sean Tillman, Heather Noe, Andrew Jahnsen, Kim Stichnote, Wade Vandelicht, Andrew Kendrick, Jami Troth

**Program Goals:** The Mathematics Department will empower students to:

- Become mathematical problem solvers
- Learn to communicate mathematically
- Learn to reason mathematically
- Learn to value mathematics
- Become confident in their own ability

This basic set of skills will allow students to continue on in whatever degree program or opportunity they choose after graduation.

**What data/evaluation criteria illustrates the effectiveness of this area?**

### **Math Interventionist Grades 2-4**

This is the first year we have had a Math Interventionist for Grades 2-4. Jami Troth serves students based on teacher and/or parent referrals. After a referral has been made, students are screened using the BVSD Universal Screener. The BVSD Universal Screeners for Elementary Mathematics is a set of number sense assessments. The series consists of fall interview assessments for kindergarten through fifth grade, and mid-year and spring assessments for grades k - 4 that combine an interview with paper

and pencil tasks. Information from this screener is used as well as formal and informal data from the classroom teacher to determine eligibility for math interventions. The goal for next school year is that teachers in the Elementary building will use Front Row Benchmark Assessments three times a year (beginning, middle, end) as a Universal Screener to determine which students are at the most risk for needing math interventions. There is currently not a universal screener available for math at the Primary. Steps are being taken to have an assessment screener in place for math in grades k-2 for the 2018-19 school year.

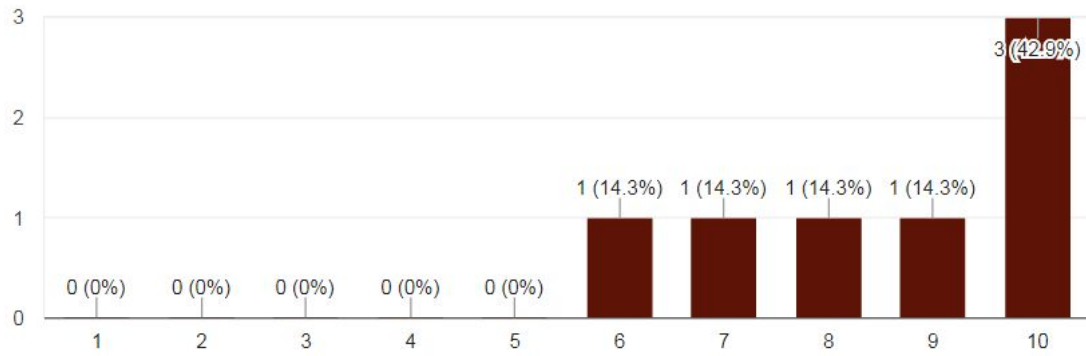
Math interventions are provided to students in small groups and instruction is individualized to the need of the students. There have been on average around 30 students being served between grades 2-4 for math interventions for the 2017-18 school year. Groups and interventions are fluid. Students can move in and out of an intervention group as needed. Data is used to qualify and dismiss a student from interventions. Classroom teachers, parents and the math interventionist work together to make informed decisions.

Mrs. Troth is working very hard to develop a strong understanding of number sense with her students. She is striving to get her students to understand the “why” behind mathematics and math computations. Having students understand “why” they are solving a problem a certain way will hopefully mean they will retain information because they’ve made a meaningful connection. Mrs. Troth helps students see problems first in a **concrete** (manipulatives, models, etc.) way, then moving to a **pictorial** (bar models, drawings, pictures, etc.) model and finally connecting those to the **abstract** (mathematical equation). She has worked hard to incorporate Greg Tang math into her daily lessons to help students build their understanding of “mental math”, all while creating meaningful connections to the numbers they work with daily.

Overall, the goal of Mrs. Troth and the math intervention program is to meet students where they are and move them forward with their learning. She strives to help students develop confidence, a strong understanding of numbers and a love for math that they may not have had coming into the school year. Please see parent survey data regarding Grades 2-4 math intervention:

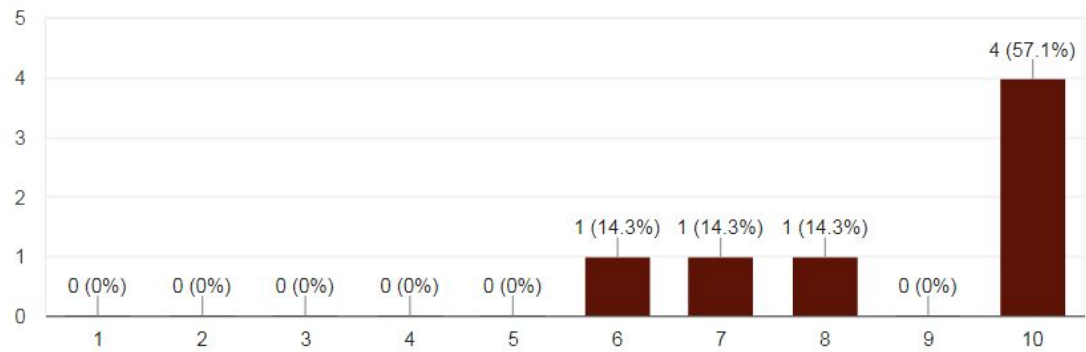
## Have math interventions helped your child(ren) become better in the area of math at school?

7 responses



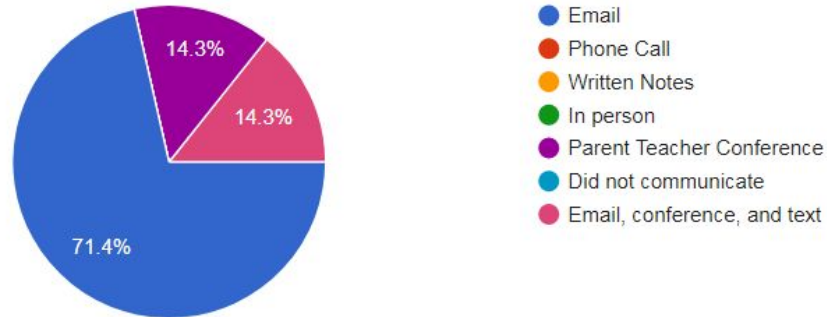
## Overall, how would you rate your child's math intervention?

7 responses



## How did the Math Intervention teacher communicate with you?

7 responses



Parent comments regarding a celebration because of their child's participation in the 2-4 math intervention program:

- My son has been able to focus on learning the math skills he needs and in the form that he understands.
- My child has been able to pass timed tests!
- My child's focus and pace have improved tremendously.
- My child has more confidence that he can do it! Seeing he is not the only one that math is hard for.
- Her grade improved much more this year than last year without an intervention teacher.

### Primary School

At the Primary School, we are continually tracking progress in regard to student achievement of stated objectives. Assessment of student growth is done through formative and summative assessments. These assessments are consistent across the grade level to maintain reliability in measurement. Collaboration about assessment results occurs within grade level teams to analyze both instructional methods and identify students in need of remediation. We are not currently using a standardized assessment because one is not available that both aligns to the Missouri Learning Standards and is created for the primary grades. Grade level teams track student data

yearly with our Student Learning Objectives (SLOs). During PLC, we analyze student progress with Data Teams and plan according to student needs. Teachers heavily supplement the current program in order to meet standards and district expectations of student achievement.

### **Elementary Math MAP Data**

In 2017, the State of Missouri assessed our student’s abilities in math via the MAP Grade-Level Assessments. The MAP data from spring 2017 was collected, disseminated and discussed during vertical teaming. The data are a tool in evaluating course content and learner understanding. We were able to compare MAP data from previous years in our district and we were able to compare our MAP results to other math learners in the state of Missouri. The data also helped identify the “bubble” students and students in the “at risk” category to provide more focused support. The Math MAP assessment results were the following:

*Percent of Students Scoring Proficient or Advanced*

<b>Grade Level</b>	<b>SoBoCo 2016</b>	<b>Missouri 2016</b>	<b>SoBoCo 2017</b>	<b>Missouri 2017</b>
<b>3</b>	<b>43.3%</b>	<b>52.1%</b>	<b>60.2%</b>	<b>53.1%</b>
<b>4</b>	<b>33.0%</b>	<b>52.5%</b>	<b>37.6%</b>	<b>53.9%</b>
<b>5</b>	<b>38.0%</b>	<b>46.4%</b>	<b>51.3%</b>	<b>48.0%</b>

### **Middle School Math MAP Data**

*Percent of Students Scoring Proficient or Advanced*

<b>Grade Level</b>	<b>SoBoCo 2016</b>	<b>Missouri 2016</b>	<b>SoBoCo 2017</b>	<b>Missouri 2017</b>
<b>6</b>	<b>24.8%</b>	<b>43.0%</b>	<b>44.8%</b>	<b>43.4%</b>
<b>7</b>	<b>55.7%</b>	<b>42.5%*</b>	<b>48.5%</b>	<b>43.4%</b>

8	36.7%*	40.3%*	28.2%	30.5%
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\* Percentage includes 7th and 8th grade students who enrolled in Algebra I.

### Middle School Algebra I End of Course Data

*Percent of Students Scoring Proficient or Advanced*

SoBoCo MS 2015	Missouri 2015	SoBoCo MS 2016	Missouri 2016	SoBoCo MS 2017	Missouri 2017
92.0%	62.0%	100%	65.8%	Participation Met	Student Participation

### High School Algebra I End of Course Data

*Percent of Students Scoring Proficient or Advanced*

SoBoCo HS 2015	Missouri 2015	SoBoCo HS 2016	Missouri 2016	SoBoCo HS 2017	Missouri 2017
66.3%	62.0%	60.0%	65.8%	Participation Met	Student Participation

### High School Algebra II End of Course Data

*Percent of Students Scoring Proficient or Advanced*

SoBoCo HS 2015	Missouri 2015	SoBoCo HS 2016	Missouri 2016	SoBoCo HS 2017	Missouri 2017
90.3%	66.1%	92.0%	70.1%	73.1%	71.9%

## ACT Average Mathematics Score

SoBoCo HS 2015	Missouri 2015	SoBoCo HS 2016	Missouri 2016	SoBoCo HS 2017	Missouri 2017
20.8	21.0	20.4	19.8	20.3	19.9

### What has changed since the last program evaluation?

The Primary School is currently in our 6th year of using Pearson's enVision MATH series (Common Core State Standards version). In addition to this, we supplement with hands-on materials to further develop students' concrete understanding of number sense, basic math concepts and fluency of addition and subtraction facts. Since enVision is being cycled out by the publisher, we are in the process of choosing programs to pilot for the next school year.

The Elementary School continues using the enVision math series adopted 6 years ago. Students display good knowledge of the vocabulary and modeling components of the core academic standards we have adopted as our foundation of instruction. Teachers supplement with additional resources to enhance student engagement. Elementary School uses pre and post testing as well as other assessments to evaluate student progress. Students track their various assessment scores in student data binders to provide accountability.

All grade levels have been using Front Row math, with Benchmark Tests assigned before students begin the adaptive practice during our RTI time. Targeted practice assignments have been used to support daily curriculum and students can use the fact practice section to improve basic fact skills. 5th Grade now has access to 3 chromebook carts and 3rd grade has access to two carts. A math support teacher has been added for support to our 3rd and 4th grade.

In the Middle School, Eagle Time (Intervention) is still a designated part of the schedule but Mondays and Fridays are PBIS reward days and often students are attending those activities and not wanting to get math help. The middle school math teachers use this

time to work with students that need math intervention (extra help or remediation on basic math skills).

The Middle School implemented (2016-2017) the Star Program to benchmark students. We also use the ALEKS program in conjunction with our math textbooks. The ALEKS program was piloted in the second semester of the 7th grade (2016-2017). Our MS math department looked to see if it helped our students in the classroom and found that it did; we wanted to implement it schoolwide and integrate it into our curriculum. To do this we switched books in the 6th grade so that it had the same series as the 7th and 8th grades. The ALEKS program is tied to our textbook and we chose the same objectives (topics as referred to in ALEKS) for the students to work on. Students receive a completion grade for ALEKS each chapter based on the percentage of topics that they complete. After the fall semester we surveyed students to find out how we could improve our implementation and use of ALEKS. We found that the large number of assigned topics was too cumbersome to complete in the given time period, many students had poor Internet service at home, and students would forget or put off doing ALEKS until the due date and could not complete it because of the large number of topics. So we listened and improved our use of ALEKS; we now only give around 20 topics per chapter, we give more time in class for students to work on ALEKS, we repeatedly publicize the deadline in class and to parents. Both parents and students have positively commented on these changes.

ALEKS is an excellent reinforcement of topics learned in class. Students that were absent can use it to learn about the topic at home then return to school and not be behind. Some students like to use it to work ahead and learn about upcoming topics they *will be learning* in class. We would like to continue using ALEKS next year.

Another change in the middle school math department was teacher assignments. Each of the teachers now teach two grade levels. Mr. Tillman teaches 6th and 7th grade math. Mr. Mertzlufft teaches 7th grade math and 8th grade Pre-Algebra and Mrs. Noe teaches 6th grade math, 8th grade Pre-Algebra and 8th grade Algebra. This has allowed the teachers to collaborate on teaching strategies and test preparation.

The High School is continuing instruction that aligns with inquiry based learning. We are increasing the technology usage, through apps and other online resources. We feel students are better able to support mathematical conclusions and use resources at their discretion. A couple of our teachers went to an EOC update workshop and were told that the EOC is moving toward an open response, checklist, and click and drag format vs. the traditional multiple choice test. After looking through the EOC practice tests, we can confirm that this is true. We know students need to be able to use the supports we are putting in place to answer these types of questions as multiple choice and process of elimination are phased out. They need to question the validity of their answers and determine what to do when an answer may not make sense. We feel the collaborative and constructivist type of teaching we are currently doing is moving our students in the right direction. We are beginning to see students be able to transfer knowledge from



one topic to another when they get to higher levels of math. We are also seeing this lead to better retention of content from course to course. We have two teachers who have completed eMINTS training and a third that is tentatively planning on starting the process in the fall. The department continues to share courses taught, because we feel it is beneficial for students to have a similar instructional experience no matter what teacher they have.

### **What next steps would better serve our students?**

Since our district is growing, and grade level teams are growing larger, we would benefit from additional professional development, especially as we are piloting new programs. We would like vertical teaming opportunities to help align instructional practices. We need an instructional coach willing to work with teachers, help write assessments, and implement curriculum. This person would provide additional support for Tier 1 core instruction. We would also like a dedicated interventionist to work with students at the primary school.

At the Elementary School, the Math Vertical Team is continually reviewing use of Front Row as to best utilize this resource. Although student use during RTI has shown some effectiveness, 4th grade reports good results from using targeted practice assignments to support daily lessons directly addressing curriculum. We continue to need more access to technology to support our curriculum at all grade levels. Additionally, we could use a dedicated math support teacher solely for all elementary grades.

During the last evaluation, Middle School made an impassioned plea to the Board regarding the need for a math interventionist. We are happy to hear we have hired a math interventionist dedicated to the Middle School. The math interventionist will be able to help our students increase their fluency in basic math skills and prepare them with algebra readiness skills. This in turn will prepare students with the needed skills to be successful in high school Algebra.

Electronic devices continue to be a need in the area of middle school math. Students access online resources on a regular basis. We have Chromebook carts, ipads and ipad mini's available for student use, but as enrollment increases so do our needs. Our department needs have been shared with administration and appreciate the consideration of additional devices for the upcoming school year.

At the high school we will continue to align our power standards with the new standards that Missouri implemented. We will continue to utilize technology and common assessments to enhance our student's math skills. In our high school calculus class we

have introduced coding using the TI-84 calculator so students can put the logic and reasoning they have learned throughout their math classes to work in a technological driven society. It is our hope that this will prepare our students for 21st century jobs. We will be discussing the addition of a math specialist or 5th math teacher at the high school to reduce class size and offer additional math classes. We would like to continue to add chromebooks to our department so we can get to a 1 to 1 chromebook to student ratio. While most students at the secondary level have a smart phone, many are not purchasing a calculator to use in their math classes. This is becoming problematic mostly due to the inadequacies of the phone applications that exist and the fact that no standardized test allows for phone or ipad usage. We will be looking at purchasing basic scientific calculators for the lower math classes, but the cost is prohibitive to purchase a class set of graphing calculators at this time. We hope through education of parents and students we can overcome this hurdle.