



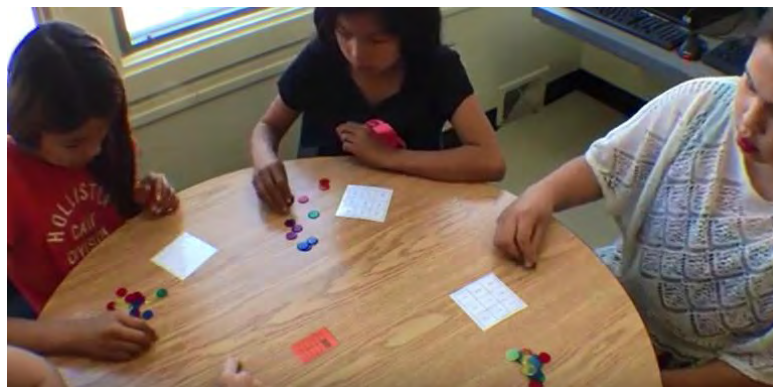
**Greater Saskatoon Catholic Schools
Focused Math Intervention**

Nominated by: Greater Saskatoon Catholic School
Division

**For the 2016 Premier's Board of Education Award
For Innovation and Excellence in Education**

September 2016

**Board Chair: Diane Boyko
Director of Education: Greg Chatlain**



Rooted Growing Reaching *Transforming*

About the Project:

Greater Saskatoon Catholic Schools submits Focused Math Intervention for the 2016 Premier's Award for Innovation and Excellence in Education. Greater Saskatoon Catholic Schools has been providing targeted math support for students who struggle in the area of mathematics. We believe that this intervention exemplifies the innovative nature of this award, as it is a supplementary math intervention that includes powerful, daily small-group focused instruction and intervention, with lessons that are engaging and systematically designed. Focused Math Intervention uses research-based improvement strategies that support students' progress toward and achievement of grade-level outcomes.

Focused Math Intervention

Students receiving Focused Instruction and Intervention in math are identified for additional support using the Greater Saskatoon Catholic Schools' Student Learning Model.



All students in the division receive **Quality Core Instruction** and differentiation within the regular classroom; provided by the classroom teacher.

Focused Instruction and Intervention

Students receive Quality Core classroom instruction in math on a daily basis outside of Focused Math Intervention. Focused Math Intervention is designed to supplement, not substitute, Quality Core instruction and differentiation. The goal of intervention is to identify and remediate gaps in math learning and bring skills up to grade level.

For students who are struggling in any academic area or struggling behaviourally, the Response to Intervention (Student Learning Model) process results in timely interventions that should assist in overcoming those threats to learning and development (Gersten & Dimino, 2006; Kame'enui, 2007).

Evidence of Direct Board Influence and Participation in the Innovation:

Board involvement includes the 2011-2016 Board of Education Priorities and Goals that indicate a priority for the enhanced learning outcomes of First Nations and Métis students (FNM). Board members reflect on board goals, strategies such as Focused Math Intervention and review student achievement based on the implementation of intervention strategies. In 2015, the board members visited a school so they could observe first-hand the success of Focused Math Intervention. The division's continued allocation of resources-both human and financial-illustrates the board's commitment to Focused Intervention in Mathematics within all schools. In addition, the respective Catholic School Community Councils are strong proponents of Focused Math Intervention as they have witnessed the improvements in student learning outcomes.

Innovative Nature of the Project:

In mathematics, the research base for early assessment and intervention is much smaller than for early reading skills. In reflection on the successful outcomes experienced by students accessing Levelled Literacy Intervention (LLI), we sought to design and create a mathematics diagnostic assessment tool linked to the learning continuum that could help identify students' readiness levels and target any identified learning gaps.

As an instructional leadership team, we set out to format Focused Math Intervention in a parallel manner to LLI. The project involved working daily with students in small groups who struggled with grade-level math. The purpose was to identify and remediate gaps in math learning with the goal of bringing students up to grade level. Focused Intervention was designed to supplement, not substitute, small-group or whole group instruction in the classroom. Students would also receive regular daily classroom instruction in math.

Program Design

The Final Report of the National Mathematics Advisory Panel (2008) outlines eight recommendations from research that provided the guidelines used in developing a successful math intervention.

1. Screen students to identify those requiring intervention.
2. Interventions should focus on:
 - Properties of whole numbers and operations (Kindergarten to Grade 5)
 - Rational numbers and advanced topics in whole number (Grade 4 – 8)
3. Instruction should be explicit and systematic providing models for problem solving, verbalization of thought processes, guided practice, corrective feedback and frequent cumulative review.
4. Instruction on solving word problems that is based on common underlying structures.
5. Opportunities to work with visual representations of mathematical ideas.
6. Devote about 10 minutes in each session to building fluent retrieval of basic facts.
7. Monitor student progress
8. Include motivational strategies

These recommendations are embedded in the components of the Focused Math Intervention process.

Lesson Format for Focused Math Intervention

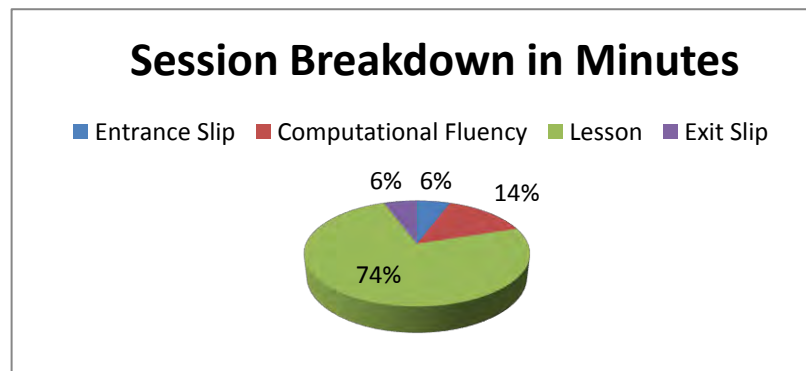
Lessons are designed using the following key criteria and guidelines.

Key Characteristics

- Lessons are provided daily and are of sufficient length (35-40 minutes) to ensure the reinforcement of new learning and to support accelerated progress.
- Lessons are provided to individuals or small groups, with a recommendation of no more than three-five children in a group. The size of the group ensures close observation and the intensive teaching interactions that promote individual learning that allows children to make rapid progress.
- The lesson format follows an established framework but allow teachers to make decisions specific to observations of the children's needs. The lessons include a portion to increase automaticity of basic skills, an activity focused on a specific basic skill or concept development, and a math journal entry.
- Lessons are fast paced, targeted and intensive in terms of focus and activity. Sessions are designed to be engaging and to build on student strengths.

Lesson Framework

Each lesson has four components: practice of basic math skills, an entrance activity, the lesson activity, and concluding or exit activities.



1. Basic Skills Practice / Fun Fact Activity (5-7 minutes)

Purpose: Increase automaticity of basic fact knowledge

- Use a variety of resources (cards, dice, dominoes, fact web, etc.)
- Game-like approach
- Record progress on Mastery Chart
- Application of strategy use to improve automaticity

2. Entrance Slip Activity (5 minutes)

Purpose: Activate prior learning

- Based on previous day's activities (concept, strategy, computation activity, etc.)
- May be completed in journal or on white board



3. Lesson Activities (20 minutes)

Purpose: Build on student understanding

- Directed by diagnostic assessment
- Delivered using instructional materials that follow a learning progression of outcomes, addressing gaps and misconceptions in learning

4. Exit Slip (5 minutes)

Purpose: Solidify learning through reflection

- Math journal entry
- Assessment of learning question

Student Selection

Initially, resources were available for a select number of schools. Participating schools were selected using division disaggregated data and FNM enrolment. Two full time Math Interventionists with backgrounds in teaching mathematics were hired.

Principals were asked to consult with teachers in their school to identify students who would benefit most from this opportunity and who met the identified criteria:

- Students struggling in the area of mathematics
- Achievement in the “yellow zone” – gaps in learning that place them below grade-level outcomes in one or more math strands
- Average cognitive ability
- Lack of success in core and differentiated instruction in the classroom
- Regular attendance

Evidence of Improved Student Achievement:

Both quantitative and qualitative assessments were conducted to measure the effectiveness of Focused Math Intervention throughout the process. Data collection occurred in the areas of:

1. Student participation
2. Basic Concepts of Math Numeracy Diagnostic assessments in the areas of Number and Patterns and Relations Strand concept mastery.
 - This assessment provides a snapshot of student performance. It is intended to give an indication of grade level outcome achievement in math.

Quantitative Data

Student achievement is reported with a pre- and post-assessment. The goal is to bring targeted students to a proficient or excellent level of achievement on grade-level outcomes of the previous grade. This ensures readiness to work toward grade-level outcomes.

Data Collection - 2 FTE Math Interventionists 2011-2016

Scoring Key

2015 – 2016 Data

| | | | |
|---------------|---|---------|--|
| Blue | 4 | 85 + | Excellent |
| Green | 3 | 60 - 84 | Proficient |
| Yellow | 2 | 46 - 59 | Progressing Toward Curriculum Expectations |
| Red | 1 | 0 - 45 | Difficulty Meeting Curriculum Expectations |

| Student Grade | Pre Assessment | Post Assessment |
|---------------|----------------|-----------------|
| 3 | 50 | 83 |
| 3 | 58 | 100 |
| 3 | 58 | 100 |
| 3 | 50 | 100 |
| 3 | 42 | 67 |
| 3 | 58 | 96 |
| 3 | 50 | 71 |
| 3 | 54 | 83 |
| 3 | 58 | 100 |
| 3 | 58 | 92 |
| 3 | 71 | 96 |
| 3 | 25 | 85 |
| 3 | 75 | 92 |
| 4 | 46 | 92 |
| 4 | 46 | 100 |
| 4 | 54 | 100 |
| 4 | 54 | 100 |
| 4 | 54 | 100 |
| 4 | 54 | 100 |
| 4 | 46 | 92 |
| 4 | 42 | 77 |
| 4 | 50 | 77 |
| 4 | 54 | 85 |
| 4 | 42 | 92 |
| 4 | 58 | 96 |

| Student Grade | Pre Assessment | Post Assessment |
|---------------|----------------|-----------------|
| 4 | 42 | 81 |
| 4 | 35 | 96 |
| 4 | 42 | 81 |
| 4 | 54 | 85 |
| 4 | 27 | 100 |
| 4 | 27 | 85 |
| 5 | 47 | 100 |
| 5 | 20 | 100 |
| 5 | 47 | 87 |
| 5 | 47 | 100 |
| 5 | 53 | 93 |
| 5 | 40 | 100 |
| 5 | 33 | 40 |
| 5 | 17 | 67 |
| 5 | 23 | 87 |
| 5 | 27 | 67 |
| 7 | 38 | 81 |
| 7 | 31 | 81 |
| 7 | 50 | 94 |
| 8 | 44 | 75 |

77% of students who participated in Focused Math Intervention are from Grades 3 - 5

Interventionists have provided Focused Math Intervention to 149 students

90% achieved proficient or excellent in grade level outcomes of the previous grade

Client Support for the Innovation:

Qualitative Data

When asked how students responded to participating in the Math Intervention, teacher comments were very positive. They stated students were **enthusiastic, motivated**, and very **excited** to attend each day. They felt a **strong relationship** was built with the math interventionist. One teacher commented that even after attending a field trip all day, her student wanted to be back in time to attend her Math Intervention time.

"[Student #80961] has made great progress in her regular math program. She is more engaged during instructional time and is more successful working independently. She now enjoys math due to the success she is having. She is less frustrated in math."

"[Student #58332] has become more focused in class. He is more confident and answers questions in class. He makes the conscious decision to sit where he is not distracted so he can attend to his work."



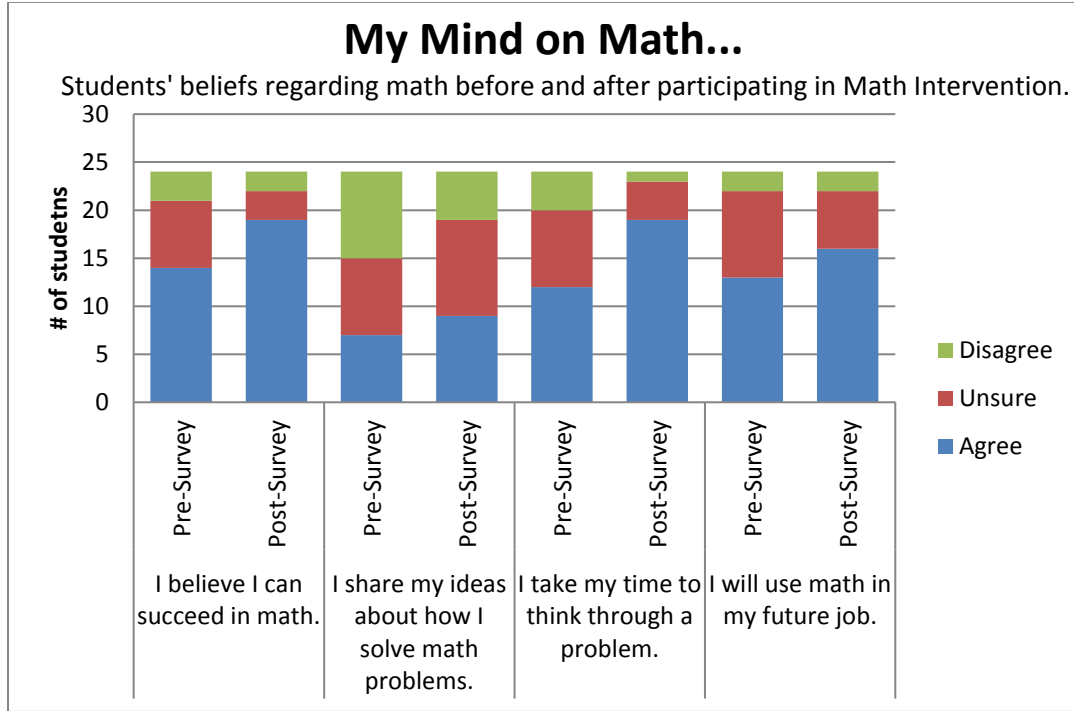
"[Student #58340] has become more positive and open regarding math. He is more willing to try questions and work through math problems."

In the classroom, teachers observed behaviours that could be attributed to success experienced in the program. Teachers felt that the students showed increased **confidence** and **willingness to participate** in classroom activities and discussions. They noticed that not only did the **quality of their work** improve, but also their **desire to work** in all subject areas in class. One teacher described a students' questioning changing from "I don't get it" to very **specific, tailored questions**. He also noted that mathematical **vocabulary improved**. He no longer had to define terms such as 'numerator' or 'denominator' which he attributed to the support he received from the work done in math intervention in fractions.

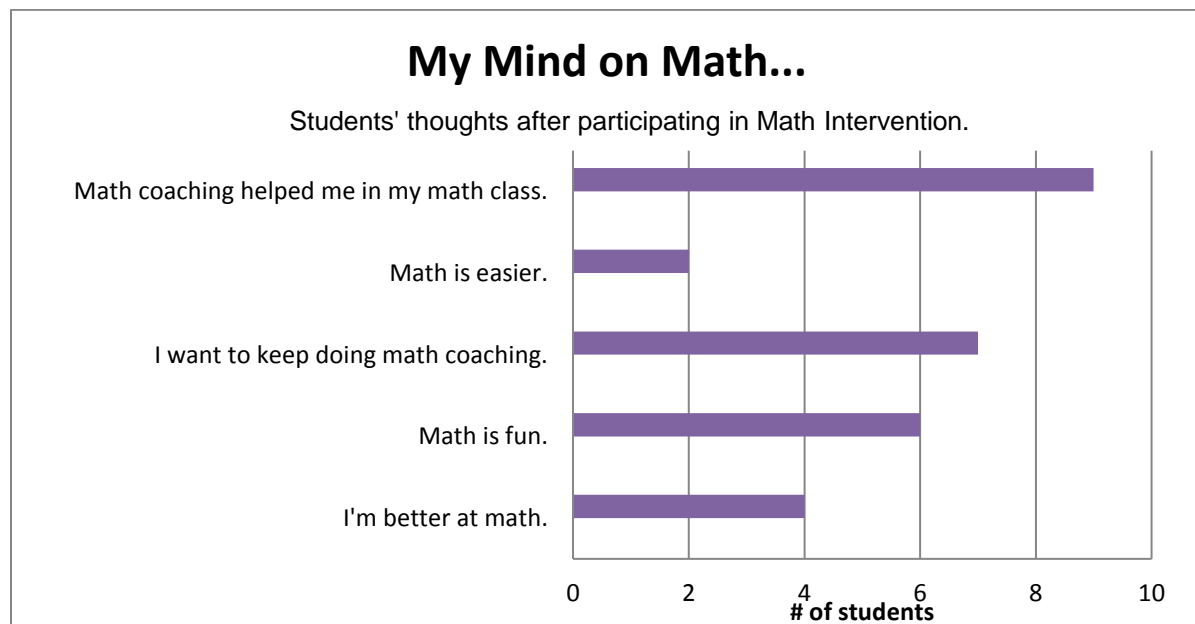
Student Self Assessment

Surveys were conducted to gauge student attitudes toward mathematics. As illustrated in the following tables, more positive impressions accompany student success.

Pre-Survey and Post-Survey Results



In the post-survey, students were given the opportunity to voice their opinions. This graph illustrates the number of students responding to the additional statements provided representing their beliefs after participating in math intervention.



Sustainability of the Innovation:

History of Focused Math Intervention in Greater Saskatoon Catholic Schools. Each year programming was further refined and developed.

2011 - 2012

Focused Math Intervention (grant funded)

- Development of the strategic, focused **lesson format**
- 2 FTE - 2 schools

2012 - 2013

Focused Math Intervention (grant funded)

- Creation of **Basic Concepts in Math Numeracy Diagnostic (BCM)** – screen and diagnostic tool
- Began collecting **effect size data**
- 2 FTE – 3 schools
- 5 Week Pilot (additional grant funding) - 4 FTE – 4 schools

2013 - 2014

Focused Math Intervention (grant funded)

- 2 FTE – 3 schools

Learning Assistance Teacher (LAT) Focused Math Intervention Pilot

- Funded from existing school allocations
- Learning assistance teachers (special education teachers) received guided and modeled supports and training to deliver math intervention to students struggling in mathematics
- St. George, St. Frances, St. Mark, St. Luke

High School Pilot

- Inception of **Bridge Math 90** course – transition planning extending focused intervention from Grade 8 to high school
- Focused intervention model moved from small group instruction to core classroom instruction
- 1 high school - 20 students

2014 – 2015

Focused Math Intervention (grant funded)

- 2 FTE – 2 schools
- 1 school - 0.2 in school allocation

Extension of LAT Focused Math Intervention Pilot

- 8 schools

Bridge Math 90

- Bethlehem High School

High School Information Session

- High school learning assistance teachers, Grade 9 teachers, administrators
- Goal to extend Bridge Math 90 into all high schools

Seeing the value of the intervention, schools began allocating staff to provide Focused Intervention outside of the LAT role.

Bridge Math 90 gave teachers one last chance to fill the gaps before moving students into high school pathways.

2015 – 2016

Focused Math Intervention (division allocated funding)

- 2 FTE – 2 schools
- 2 schools - 0.2 in school allocation

Learning Assistance Teacher (LAT) Focused Math Intervention

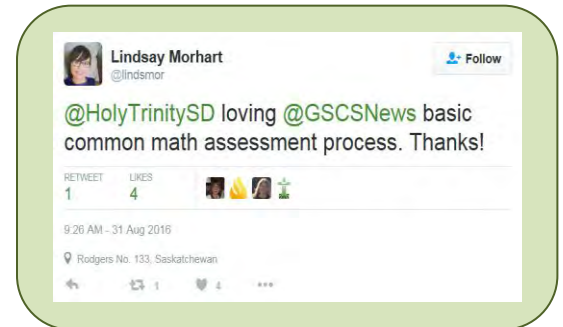
- In all remaining elementary schools within Greater Saskatoon Catholic Schools

Bridge Math 90

- Extended to all high schools – 5 high schools, 7 classrooms

Provincial and Partnership Collaboration

- Division sharing of resources to many school divisions province wide has led to collaboration and further refinement and use of Focused Math Intervention resources.
- Through the division's partnership with Saskatoon Tribal Council (STC), Focused Math Intervention has been, and continues to be, used and supported in schools within STC. Our continued collaboration regarding the intervention supports the refinement and use of the resource.



Cost of Innovation Related to Benefits Achieved:

Cost of Training

Every year, new LATs and new Grade 9 teachers are offered individual or small group training opportunities on how to effectively deliver the intervention. This training and ongoing support is essential in maintaining the integrity and fidelity of this intervention. Training occurs in preparation/collaborative planning time or before and after school. In addition, teachers receive job-embedded support from the math consultant.

Cost of Staffing

The employment of two full-time math interventionists is the most significant on-going cost. These positions are vital for the ongoing development and success of the intervention and our ability to target improved outcomes for FNM students.

Cost of Resources

Manipulative kits are purchased for all programs to support student learning along a concrete to pictorial to abstract (CRA) continuum. Mathletics licenses are purchased for high school students in addition to those purchased for all Grade 1 – 8 students.

Concluding Remarks:

Focused Math Intervention provides an opportunity to address gaps in the development of mathematical concepts. Students involved in the intervention benefit from the consistent support and intensive intervention. These students not only acquire skills, but they also grow in confidence which transfers into successful experiences in all subject areas. Evidence supports the continued investment of resources to ensure all of our students meet division and provincial curricular expectations with respect to competency in mathematics.

