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Winnipeg School Division

Math Drills Program: Evaluation Report (2014–2017)

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The drills program seemed to have improved fluency, confidence, and metacognitive habits, with achievement gains most evident where fidelity and progress monitoring were strong. Daily practice, class graphs, and student goal-setting fostered motivation and ownership, especially in the early grades. However, results weakened in split and upper grades, and system-level assessments showed inconsistent translation into achievement. Moving forward, early intervention in K–3 and a digital version of the program could help sustain fidelity, streamline progress monitoring, and maximize equity impact.

Introduction

Since 2014, the Winnipeg School Division (WSD) had implemented the Spirit of Math (SOM) drills program to improve student fluency, confidence, and achievement in mathematics. This report synthesized data from drill reviews, teacher surveys, classroom participation records, and division-wide assessment results (2015–2017) to evaluate program impact and identify conditions under which the program had been most effective.

Program Rationale

The drills program had been introduced to strengthen:

- Computational and procedural fluency
- Mental flexibility and working memory efficiency
- Graphing, data analysis, and interpretation skills
- Goal-setting, focus, and perseverance
- Reduction of math anxiety through reflection and progress tracking

Implementation and Fidelity

- 77% of surveyed teachers reported that they had successfully implemented drill expectations as outlined in training.
- 74% had reported using drills daily.
- 71% had used class data to motivate students and,
- 55% had discussed class averages.

Stronger results were observed in single-grade classes compared to split grades.

Teacher Learning and Confidence

- 89% of teachers reported improved or increased confidence in their own math learning.
- Modules such as problem solving, signed numbers, and number sets had been especially impactful.
- Teachers had valued support from colleagues (69%), online videos (62%), district workshops (62%), and online coursework (64%).

Student Outcomes

FLUENCY GAINS HAD VARIED:

- Grade 4 (60–69% targets met),
- Grade 5/6 (47–65%),
- Grades 7–9 (31%).
- Students in **high-fidelity classrooms** had independently graphed results (88%), set goals (56%), and reflected on progress (53%).
- Teachers reported increased student motivation (48%) and confidence (63%).
- Division assessments showed uneven impact, while Grade 8 exam pass rates had remained ~50–60%.

First-to-last drill progress data for 2016/17

GRADE 4 (53 CLASSROOMS)

- October: 1/53 classes met target (2%)
- June: 9/53 classes met target (17%)

Progress: +15 percentage points

GRADE 5 (91 CLASSROOMS)

- October: 1/91 classes met target (1%)
- June: 56/91 classes met target (62%)

Progress: +61 percentage points (largest gain)

GRADE 6 (78 CLASSROOMS)

- October: 0/78 classes met target (0%)
- June: 14/78 classes met target (18%)

Progress: +18 percentage points

GRADE 7 (60 CLASSROOMS)

- October: 0/60 classes met target (0%)
- June: 15/60 classes met target (25%)

Progress: +25 percentage points

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Key Takeaways

- Strongest growth: Grade 5 (huge jump from almost none to nearly two-thirds of classes meeting fluency targets).
- Moderate growth: Grades 6 and 7, though overall proportions stayed low.
- Weakest growth: Grade 4 (small gain, still under 20% by June).

This confirms that **progress over the year did occur**, particularly where **targets were feasible,** fidelity was higher, and **progress was monitored** (as seen in Grade 5).

Conditions for Achievement Gains

The program had worked best under three conditions:

1. High fidelity of implementation (daily drills, expectations met).
2. Progress monitoring and feedback (graphs, goals, student tracking).
3. Professional learning supports (peer networks, videos, workshops).

Challenges and Limitations

Fidelity gaps had been evident in split and upper grades, misalignment between fluency targets and assessments had limited transfer, inequity risks had emerged if supports were uneven, and heavy data collection burdens had reduced granularity of insights.

Recommendations

1. REINFORCE FIDELITY IN UPPER AND SPLIT GRADES

- Provide pacing guides and combined target ladders.
- Launch fidelity "sprints" in Grades 5–9 with coaching and feedback.

2. STRENGTHEN PROGRESS MONITORING PRACTICES

- Require use of class graphs and goal-setting in all classrooms.

3. SHARPEN ASSESSMENT ALIGNMENT

- Map drill targets directly to division assessments and Grade 8 exam strands.

4. SUSTAIN TEACHER LEARNING NETWORKS

- Scale up micro-PD (videos, peer sharing, short workshops) on high-impact practices.

5. EQUITY GUARDRAILS

- Target extra coaching and resources to schools with persistently low attainment.
- Monitor progress by subgroup to ensure gap closure.

6. Explore/Implement digital enablement of drills (to automate progress monitoring and strengthen fidelity, e.g. using a Drills App, it could make implementation easier and less time consuming).

7. Emphasize early intervention in K–3 (where gains compounded most over time).

Suggested Key Performance Indicators (KPIs)

- **Fidelity:** % of classes drilling ≥4 times/week
- **Fluency:** % of classrooms meeting grade-level targets
- **Application:** Weekly "bridge set" average scores meaning seeing how fluency can support complex reasoning and problem solving thus supporting overall achievement in Math
- **Confidence:** % of students reporting increased confidence
- **Achievement:** % at/above on division assessments; Grade 8 exam pass rates

Conclusion

- The drills program had strengthened fluency, confidence, and metacognitive habits.
- Achievement gains had been strongest where fidelity and monitoring were high.
- However, system-wide results had remained inconsistent without bridges to application.
- Moving forward, early intervention (K–3) and implementation with fidelity should be high priority. Digital delivery could support implementation and automated progress monitoring promoting equity and long-term success. If this is done, a well-designed data collection plan should be done to see longitudinal trends.

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