MEMORANDUM

March 8, 2022
Regular Board Meeting

TO	Board of Trustees
FROM	Shauna Boyce, Superintendent
ORIGINATOR	Scott Johnston, Associate Superintendent
RESOURCE	Katherine Mann, Division Principal, Indigenous Education and Numeracy
GOVERNANCE POLICY	Board Policy 1: Division Foundational Statements Board Policy 2: Role of the Board Board Policy 12: Role of the Superintendent
ADDITIONAL REFERENCE	BP 1: Vision, Foundational Statements BP 2: Education Planning and Programming *Education Act: 19-23, 33, 196-197*
SUBJECT	**NUMERACY REPORT**

PURPOSE

For information. No recommendation required.

BACKGROUND

The Board is charged with the responsibility of providing, for its students and their parents, an education system organized and operated in the students' best interests. It exercises this responsibility through setting of local educational policy and the wise use of resources. An ongoing focus on numeracy education and intervention aligns to the Provincial Government's grant for unfinished learning (learning loss) and supports our students' success and well-being.

REPORT SUMMARY

This Numeracy Report provides an overview of the numeracy intervention processes currently in place across the Division. The report includes current, and historical, numeracy results reporting to support an understanding of the requirement for intervention.

Administration would be pleased to respond to any questions.

SJ:kz

NUMERACY REPORT
March 2022

Presented to the Board of Trustees, March 8, 2022
Scott Johnston, Associate Superintendent, Education and System Services
Resources: Katherine Mann, Division Principal, Indigenous Education and Numeracy

Our Students Possess the confidence, resilience, insight and skills required to thrive in, and positively impact, the world.

Background

Parkland School Division's Mission and Foundational Statement:

> *We assure supportive learning environments, meaningful experiences and healthy relationships that create opportunities to develop resilience, to gain diversity in perspectives and to achieve enduring success.*

The Instructional Services department continues to focus on the enduring academic success of our students. Parkland School Division values numeracy, and for the 2021-2022 school year has allocated resources to have a division principal and facilitator to lead the numeracy work in all schools. This priority area focuses on the following Assurance Elements within the domain of Learning Supports:

Element 4: Teachers and Leaders Promote Literacy and Numeracy

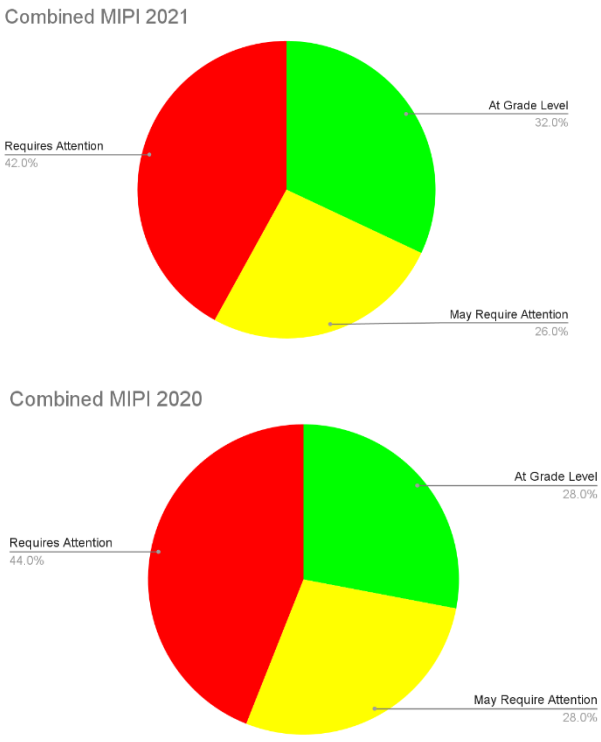
Element 5: Teachers and Leaders Collaborate

NUMERACY INTERVENTION

For the past two years, Parkland School Division has initiated a division-wide screener called the *Math Intervention Programming Instrument* (MIPI) that was developed by Edmonton Public School Division. The purpose of this instrument is to determine which students may have misconceptions or partial conceptions that may interfere with the required learning in mathematics for the upcoming year.

This year, as a result of the Alberta Government's Learning Loss Grant, Parkland School Division developed and implemented a diagnostic instrument that is designed to drill down and determine more specifically where students were in their learning progression. The instrument was based on the learning trajectories described in *Early Childhood Mathematics Education Research* (Sarama and Clements, 2009).

In order to best remediate the needs of students in an efficient manner, it is necessary to determine what students know, understand and are able to do, and then move them forward from that point. It was determined that these learning trajectories, in a similar fashion to the literacy continuum developed by Fountas & Pinnell, would meet that need.



The four learning trajectories identified for focus, out of the many that are described in the research, were: Subitization, Counting, Comparing and Ordering and Addition/Subtraction. In other words, the Learning Loss Grant intervention would focus on number concepts that are essential to providing the foundation for success in Mathematics.

The diagnostic instrument is a one-on-one interview that uses observations and conversations with students to determine what students truly understand, as opposed to paper-pencil performance of calculations. Quite often, students can perform a task in Mathematics at a procedural level without conceptual understanding. Using the interview approach made the misconceptions and partial conceptions very apparent. Once the students were interviewed, they were placed on the continuum and schools used that information to begin planning the interventions accordingly.

It should be noted that while the interview provides excellent information about students, it is a very time intensive endeavour as it can take anywhere from 20-45 minutes per student. The interviews were conducted either by the school-based Numeracy Leads, the classroom teacher, or a combination of both. Release time from the grant was provided to support this work. Based on the four learning trajectories identified, which focuses on the Number strand in the Mathematics Program of Study, the following lags in development were identified:

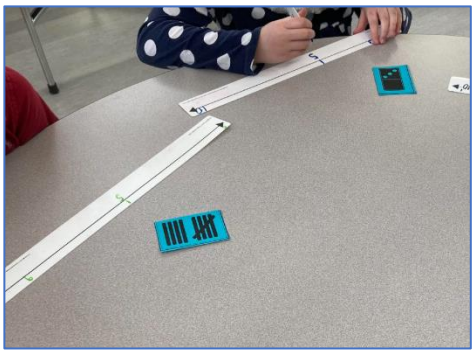
Grade	Average Months Behind
Grade 1	17 Months (Early Kindergarten)
Grade 2	10 Months (Early Grade 1)
Grade 3	15.6 Months (Mid Grade 1)

It should be noted that while we did use a MIPI for Grade 1 at the beginning of the year, given that a significant amount of time had passed from the beginning of the year to January, when we were required to submit the Learning Loss Grant for the Grade 1s, teachers were asked to identify the students they felt had not made sufficient progress in that time. They completed a form for each student that indicated their observations based on the criteria from the Learning Trajectories.

The greater number of average months behind for the Grade 1 students is possibly due to two factors. The first is that we relied on the teachers to use the MIPI and their professional judgment regarding students who would require a pullout intervention, so it is likely that this group includes students who are in a more severe range. Secondly, we know that the younger the student, the more they have been impacted by the disruption to learning due to COViD as they lack exposure to the foundational learning. As well, we see a greater number of students identified at the Grade 3 level by the MIPI due to the greater emphasis on arithmetic operations.

Grades 1-3 Numeracy Intervention Programming

In December of 2021, the Early Numeracy Leads from each of the 18 schools with Grades 1-3 students, came together to begin planning the intervention programming. For the first month of the intervention, the focus would be on visual recognition of number (subitization) and counting. The leads came together again in January to discuss next steps with Comparing and Ordering with number line work, and the next session will focus on Addition and Subtraction. The intervention program is set to run for 15-20 minutes per day, 4 or 5 days a week for 16 weeks.



Math Focus: Grades 4-12

In light of the excellent information about learning that we were seeing come out of the Early Years Numeracy interview, a Middle Years Interview has also been developed this year. However, as the learning trajectory research that supports the Early Years Interview only goes up to grade 3, a learning continuum for number in the Middle Years has also to be developed. What early interview information is beginning to show is that identified students in the middle years have often not yet acquired:

- Fluency to ten,
- Place value fluency,
- Operation sense (an understanding of how mathematical operations connect to a variety of real-world contexts), and
- Fraction sense (an understanding of the different meanings and uses of fractions).

The plan to respond to these needs is to develop a framework that will guide instruction to include the use of diagnostic information, a plan for small group instruction, and the development of conceptual understanding through contextualization, verbalization and visualization before moving to procedure.

LEAD TEAM NUMERACY PD

Ten schools are involved in a Numeracy focused professional development group that meets once a month during the morning of Lead Team meetings. Members of this group are collaborating to identify and share their process for improving numeracy and success in Mathematics.

NUMERACY: HISTORICAL RESULTS

Students are scheduled to write the 2022 Provincial Achievement Tests. Our students' results will continue to inform future interventions that may be required. Pre-Pandemic results for grade 9 mathematics indicated a slight decrease in year-over-year achievement at the acceptable standard, with an increase in year-over-year achievement at the standard of excellence.

Provincial Achievement Tests

Math 9 (All)	Alberta					Parkland School Division						
	14-15	15-16	16-17	17-18	18-19	14-15	15-16	16-17	17-18	**18-19**	+/-	Gap
Acceptable	65.3	67.8	67.2	59.2	60.0	67.5	61.7	63.5	57.0	53.9	-3.1	-6.1
Excellence	17.9	17.5	19.0	15.0	19.0	11.3	11.9	15.6	10.5	12.6	2.1	-6.4
Percentage Writing	89.4	89.5	89.0	88.7	89.0	94.3	92.6	94.9	93.9	92.2	-1.7	3.2

Historical results indicate that Parkland School Division students were performing below the provincial average in both standards with respect to the Provincial Achievement Test. The Division had a greater overall percentage of students writing the test, than did the province.

Pre-Pandemic results for grade 6 mathematics indicated a slight decrease in year-over-year achievement at the acceptable standard, with an increase in year-over-year achievement at the standard of excellence.

Math 6 (All)	Alberta					Parkland School Division						
	14-15	15-16	16-17	17-18	18-19	14-15	15-16	16-17	17-18	**18-19**	+/-	Gap
Acceptable	73.2	72.2	69.4	72.9	72.5	70.2	70.7	62.4	69.6	66.7	-2.9	-5.8
Excellence	14.1	14.0	12.6	14.0	15.0	7.5	8.6	7.3	6.9	10.2	3.3	-4.8
Percentage Writing	90.8	90.9	90.5	91.1	90.8	94.5	94.6	94.5	94.2	96.2	2.0	5.4

Historical results indicate that Parkland School Division students were performing below the provincial average in both standards with respect to the Provincial Achievement Test. The Division had a greater overall percentage of students writing the test, than did the province.

CONCLUSION

While we are relatively early into the grade 2/3 intervention programming, numeracy leads are already indicating that they are seeing observable growth. The clarity of the continuum and the resulting ability to target intervention directly at the stage of the student's development is giving early indicators of success.

The plan moving forward will be to work with classroom teachers to "push in" the intervention activities to the Universal Level of support as well as to continue to work with the Numeracy Leads at each site as a source of professional guidance and capacity building. This work will also have implications for how we design professional development to support the roll-out of new curriculum. And, as previously stated, the work will continue to develop a Numeracy Continuum that extends into the Middle Years to guide the practice at those levels of instruction.

While we recognize our challenges in Numeracy and Mathematics instruction are significant, we are confident that we are laying important groundwork to move the Division forward in this area.