HALTON CATHOLIC DISTRICT SCHOOL BOARD CDSB

MATHEMATICS ACTION PLAN

2019-2021

Achieving Believing Belonging

HCDSB Mathematics Action Plan 2019- 2021

At the Halton Catholic District School Board, our desire is for all students to find enjoyment in mathematics and to believe they are capable of reasoning and of applying mathematical thinking in their daily lives. We believe that when instruction, resources, and the learning environment are well suited to students' particular strengths, interests, needs, and stage of readiness they will feel a sense of belonging, leading to increased understanding and achievement.

By our Catholic nature, we aspire to help students become who God intended them to be and we believe that this achievement is directly related to the relationships we, as educators, build with our student population. With a focus on viewing mathematical learning through a developmental lens, assessment for learning practices will support educators in providing instruction that is precise to the level of readiness of each student and tailored to individual learning needs.

As Catholic educators, teacher practice is never a judiciary function of employment, but a promise of baptismal fulfillment to spread the good news in word and deed. Student achievement should be increased when we recognize that the relationships we create with students and the content of any subject is part of our vocational call.

The 2019-2021 Math Action Plan will address the following goals:

- Ensuring instruction provides opportunities to learn important mathematics concepts and procedures with understanding (**Math UP, Math Monitoring Projects**)
- Ensuring all students have a strong understanding of the fundamentals of math (**MathUP, Math Monitoring, Numeracy Screener Projects**)
- Employing the use of models/ tools to show mathematical ideas visually as well as foster connections among different strategies and concepts (**MathUp, Math Monitoring Projects**)
- Implementing tasks that can be approached in many ways to promote reasoning, problem-solving and equity (**Intermediate Math Project: Building Thinking Classrooms, MathUP, Math Monitoring Projects**)

"Be shepherds of God's flock that is under your care, watching over them- not because you must, but because you are willing, as God wants you to be…eager to serve."

1 Peter 5:2

LEARN MORE!

Hover over **blue text** to see definitions.

Achieving Believing Belonging

MathUP School/Math Monitoring and Learning Project

GOAL	OUTCOMES	STANDARD FOR SUCCESS	ACTIONS
Students demonstrate mathematical proficiency *Definition of proficient: Students demonstrate: • understanding, • computational fluency, • problem-solving abilities • flexible reasoning • ability to justify • explain thinking **Definitions:** Conceptual Understanding: Understanding the 'whats' and the 'whys' as opposed to having a 'silo' understanding; Having a flexible web of connections and relationships within and between ideas. Procedural Fluency: Ability to choose and carry out procedures accurately and efficiently	**Students:** - Students develop flexible methods for computation - Students have a deep understanding of how operations and properties of the operations, especially the commutative and associative properties. - Students confidently use models to solve contextual problems for all operations and to determine what operation is involved in a problem regardless of the size of the numbers.	- Students will have multiple strategies they can use when approaching problem solving contexts	- Students engage in purposefully selected number strings/ questions that will help elicit particular strategies - Students engage in problem-solving contexts that reinforce development of procedural and conceptual understanding
	Teachers: - Teachers will ensure students develop conceptual and procedural fluency to support efficient problem solving strategies - Teachers will embed different contexts of addition and subtraction (story problem types) to support the development of flexible understanding of the operations - Teachers will ensure students have fluency with addition, subtraction, multiplication, and division math facts - Teachers consider the developmental phases students move through when developing proficiency: counting, reasoning strategies, and mastery (automatic recall) (Baroody, 2006)	- All teachers will use developmental phases to support them in identifying student's abilities and appropriate developmental next steps (ie zone of proximal development)	- Number routines are intentionally chosen in support of the development of flexible thinking that will eventually be applied in problem-solving contexts (number strings, number talks) and become part of daily practice within the classroom Mathematics Monitoring Project - MathUP (to identify student needs) - SPTL Professional Learning Sessions - *Professional Learning with Dr. Alex Lawson (for schools in Phase 2 of Support)*
	Administrators: - Administrators develop confidence in leading professional learning in mathematics - Administrators create a school improvement cycle through the use of the MathUP resource - Administrators be able to identify different strategies, tools/models and types of questions that support the development of flexible thinking and understanding Administrators create opportunities to observe student learning in the mathematics classroom on a consistent basis to support professional learning conversations - Administrators work with their staff to use data to determine models that are to be used consistently throughout grade 1-8 classroom	– Administrators are able to discuss monitoring evidence during professional learning sessions (Sunrise session) (e.g. classroom observation evidence, marker student evidence)	- Mathematics Monitoring Project - MathUP - Monthly Sunrise Sessions

Five schools will participate in Mathematics Monitoring and Learning Project as an extension of MathUP

Intermediate Math Project: Building Thinking Classrooms

GOAL	OUTCOMES	STANDARD FOR SUCCESS	ACTIONS
Students are able to uncover concepts through rich tasks (low floor, high ceiling)	**Students:** - Students actively engage in rich tasks, entering at their level of understanding - Students solve problems by analyzing and interpreting the information they've been given, including asking appropriate thinking questions to deepen their understanding - Students justify their solutions - Students work collaboratively with their peers to use each other's knowledge and skills to solve problems	- Students will demonstrate engagement (uptake/time on task) with tasks that are both challenging and within their ability. - Students will know to ask questions that will help them persevere in completing challenging tasks	- Use of vertical non- permanent surfaces (white board, chalk boards) when collaborating with peers to solve rich tasks - Use of random groupings - Collaboratively develop reflective questioning strategies to build upon one's thinking
	Teachers: - Teachers provide students with rich tasks (low- floor/ high ceiling) that focus on and promote student understanding of important mathematical concepts - Teachers anticipate student responses to rich problems in order to notice and name potential strategies students use and what this indicates about their level of understanding - Teachers have confidence to respond 'in the moment' with appropriate next steps that will support students within their zone of proximal development (right level of challenge) - Teachers provide students with opportunities to collaborate on problem solving tasks - Teachers only answer questions that promote deeper thinking - Teachers encourage students to communicate mathematically with one another, questioning choices and assessing the work of others to gain a deeper understanding - Teachers create opportunities for students to build autonomy for their learning (e.g. model how groups can visit other groups when they are stuck or done)	- Using their curriculum document, teachers understand the underlying concepts/ expectations behind the rich task Teachers can effectively - articulate possible student responses and plan next steps accordingly	- Use of learning goals and success criteria - Use of vertical non-permanent surfaces - Use of random groupings - Build autonomy - Consolidate learning using student work to frame the conversation - Teacher data collections includes conversations, observations and products (formative assessment)

Numeracy Screener Project: Kindergarten Year 1 and 2

GOAL	OUTCOMES	STANDARD FOR SUCCESS	ACTIONS
Students demonstrate and understanding of numbers, quantities, and relationships and will apply this understanding within contextual play	**Students:** - Students have opportunities to engage in guided play (intentionally selected activities with an educator) including many authentic opportunities to practice counting - Students instantly recognize briefly shown collections up to 5 and verbally name the number of items. (Perceptual Subitizer) - Students verbally label arrangements to 5 (“I saw 2 and 3 so I saw 5”), 6, then up to 10. (Conceptual Subitizer) - Students demonstrate understanding of Counting Principles such as one-to-one correspondence. They can co-ordinate the verbal names (stable order) with the action of pointing to objects one- by –one. - Students demonstrate an understanding that counting tells us the quantity in a set. They understand that the last word in the counting sequence names the quantity (cardinality) - Students strengthen their visual- spatial working memory through composing, decomposing and recomposing shapes	- Students will demonstrate the development of number concepts and number relationships through engagement in rich mathematical experiences (in the context of play) - Students will engage in intentional spatial reasoning tasks (in the context of play) develop greater spatial thinking abilities	- Students engage in mathematical provocations within the context of play Students have opportunities to question and - reason mathematically Students engage in guided instruction within the context of play
Students deepen their spatial reasoning skills, through a variety of rich learning opportunities within the context of play	**Educators:** - Educators understand the connection between conceptual understanding of spatial reasoning and number sense within the context of play - Educators understand the relationship between visual-spatial working memory and mathematics learning and achievement - Educators understand the developmental phases of counting. They will notice and name important counting principles such as cardinality, magnitude, stable order, one-to-one correspondence, conservation and support students as they move through these phases. - Educators understand the concept of subitizing and will support students in transition from perceptual subitizing to conceptual subitizing	- Educators will deepen their understanding of early number concepts and number relationships. - Educators will notice and name student understanding about number (through the context of play) and determine developmentally appropriate next steps/ activities. Educators will deepen their - understanding of how spatial reasoning develops and how different provocations can support students in accessing their spatial reasoning.	- Administer Numeracy Screener - Engage in play-based activities that target development of number concepts and relationships as well as spatial reasoning (i.e. Tiny Polka Dot) Consider Developmental - Continuum from *What to Look For* Resource when noticing and naming students actions Access *Taking Shape* Resource when developing a variety of rich learning opportunities

MathUP School

Purpose	MathUP is an online platform that focuses on using the seven stages of the School Improvement Cycle to support principals in gathering, analyzing, and quantifying data to promote whole school professional learning around Additive Reasoning and Connected Number Thinking in students from grades 1-8.
Objectives	**To support principals in:** - Knowing what to focus on mathematically; - Leading a cultural shift in mathematics instruction; - Engaging all teachers from Grades 1-8 in mathematics learning; - Measuring and sustaining improvements in mathematics; - Deepening teacher math expertise and pedagogy.
Phases of Support	**Sunrise Sessions for Administrators** – Monthly The dates are: September 17th, October 28th, January 27th, February 28th **SPTL Professional Learning sessions** — Quarterly – 4 x (.5 day) sessions will be offered to provide professional learning to Special Project Team Leads in order to build capacity around models/tools, strategies and worthwhile tasks. - The dates are: Sept 30th, Nov 21st, Jan 28th, & Apr 21st

And Jesus said to them, "What are you discussing with each other while you walk along?

Luke 24.17

Phases of Support

Phase 1 Support

Desired Outcome: **Schools will create a mathematics learning cycle to monitor and measure the impact of their instruction on targeted student learning.**

- Schools involved in Phase 1 will be involved in the Mathematics Monitoring and Learning Project – support will involve Professional Learning responsive to student needs;
- The focus for teachers will be to deepen mathematical content knowledge from a developmental perspective in order to support student learning needs;
- Support will be given to administrators to build both content knowledge and understanding around creating a monitoring cycle in mathematics;
- Teachers will be provided opportunities to deepen content knowledge around foundational number concepts and explore how these understandings develop along a trajectory of learning.

Phase 2 Support

Desired Outcome: **Administrators will have the knowledge and leadership skills needed to focus on deepening teacher confidence in supporting student learning needs through an asset lens.**

- Schools involved in Phase 2 participated in the Mathematics Monitoring and Learning Project through the 2018-2019 school year;
- Administrators will be provided monthly Sunrise Sessions to continue the work around creating and supporting mathematics monitoring cycles within their schools;
- Consultant support will be available to support administrators in planning professional learning opportunities within their schools.

Desired Outcome: **SPTLs will have the necessary content knowledge to support their colleagues and administrator(s) in providing professional development within a learning cycle, as outlined in their School Improvement Plan.**

- SPTLs will receive release time (4 times a year) to support Professional Learning based on developing student number sense and flexibility.

Phase 3 Support

Desired Outcome: **Administrators will have the knowledge and leadership skills needed to focus on deepening teacher confidence in supporting student learning needs through an asset lens.**

- Administrators will be provided monthly 'Sunrise Sessions' to support monitoring the mathematics goal outlined in their school's SIP;
- Consultant support will be available to support administrators in planning professional learning opportunities within their schools.