School: Cornwall Collegiate & VS

Principal: Chris Boulay

Vice-Principal(s): Tracy Armstrong Marty Dettman

Area of Focus: Numeracy	
Overall Goal: Improve achievement as measured by Grade 9 EQAO Applied Math Assessment, by 5%, by June 2018	

Needs Assessment / Where Are We Now??

From the 2015-2017 EQAO – Grade 9 Math Assessment
- *approx. 34% of our grade 9 Applied writers were at levels 3/4 over a two-year span (2014-2016 and 205-2017)*
- *noted improvement in level 3/4 learners from January to June 2017 (less than 10% were at level 3/4 in January; approx. 50% were at level 3/4 in June)*
- *according to IIRs, students continue to lag behind the Board and Province in the following strands: Linear Relations and Number Sense and Algebra*
- *according to IIRs, students continue to lag behind the Board and Province in the following skills: Knowledge and Understanding and Thinking*

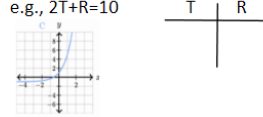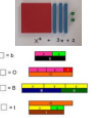|	*ACT*	*ASSESS*	*REFLECT*
PLAN: Needs Assessment **Where are we now?**	**ACT: Evidenced-Based Strategies/Action** **What are we going to do?**	**ASSESS: Monitor/Gather Data** **How are we doing? What evidence do you have?**	**REFLECT: Analyze/Reflect** **How did we do? Where to next?**
1st CYCLE OF INQUIRY **Starting June 29, 2017** *If/Then Statement: Posted by October 10, 2017* If we continue to focus on co-creating learning goals and success criteria with students for problem solving, then instruction will be more intentional and students will be able to solve problems at, or above, provincial standard by June 2018.	*Actions will be outlined in the three learning team meetings through the "SIPSA Monitoring Template" and summarized here at the end of the cycle on November 17th* • Teachers focused on problem solving process and worked on making student thinking visible. • Learning Goals posted and shared with students • Math PLT co-creates and shares a common assessment tool for problem solving with students • Teachers begin using tracking tool that includes evidence of triangulation of data (conversations, products, observations) with reference to three marker students • Staff use tasks to gauge baseline data and create intentional moves to address gaps • Staff begin to think about post-intentional move data and assessment of impact of move	*Data Gathering will be outlined and collected in the first three learning team meetings through the "SIPSA Monitoring Template" and summarized here at the end of the cycle – November 17th* • Students in grade 7 as well as in both academic and applied courses were able to demonstrate some level of learning using a problem-solving inquiry problem • Some students demonstrated that they were at differing points on the Visual to Concrete continuum • Students often drew diagrams to show thinking • At mid-term, grade 9 applied math students are on course to meet predicted outcomes at levels ¾ according to math data collection tool	*Reflections of Learning Teams work for cycle one will be summarized here at the end of the cycle by November 17th and posted on Insite* • Teachers will build in more time for collaborative planning with each other re problem solving and inquiry • Teachers will become more accurate and intentional with documenting results of intentional moves with marker students • Students will continue to be supported on successful problem solving strategies related to proportional reasoning and linear equations • Teachers will explore technology to capture student progress to inform their practice
2nd CYCLE OF INQUIRY **Starting November 20, 2017** *Complete this section with any new data from your 1st Cycle of Inquiry.* *If/Then Statement: Posted by December 1, 2017* If, in response to areas of student progress made visible through student work, teachers will plan intentional instruction, and use pre/post data to inform instruction, then students will be able to demonstrate improvement on a post assessment of the same or a similar task.	*Actions will be outlined in the three learning team meetings through the "SIPSA Monitoring Template" and summarized here at the end of the cycle on March 9th, 2018* • Staff will use a data collection tool, such as OneNote, to document evidence of student learning in order to determine next steps • Staff will begin to use photos, videos, and/or audio clips to support assessment through triangulation of data • Staff will develop rich tasks, with multiple entry points, to help students build problem-solving skills	*Data Gathering will be outlined and collected in the three learning team meetings through the "SIPSA Monitoring Template" and summarized here at the end of the cycle on March 9th, 2018* • 3/5 teachers are using OneNote, or other forms of electronic documentation, to monitor student learning • In the elementary panel: o 3/3 focus students used the success criteria; when this criteria was absent, students asked to see it o flexible groupings have positively-impacted student achievement for 2/3 students (note:	*Reflections of Learning Teams work for cycle two will be summarized here at the end of the cycle on March 9th, 2018, and posted on Insite* • Staff have demonstrated growth and improvement in pedagogical practices; staff will continue to build capacity in exploring rich tasks while continuing to collect student data using their monitoring templates • Staff will develop intentional teaching strategies based on student needs. They will then implement, analyze and refine them to promote student success

	• Staff will use intentional grouping in order to promote accountable talk, use of manipulatives, and collaborative inquiry
	• Staff will continue to use co-constructed learning goals and success criteria to support student learning
	• Staff will use the monitoring template to capture student assessment data and intentional teaching moves
	• Staff will participate in classroom observations to demonstrate rich tasks, observe students completing these tasks, and to share best teaching practices
		level 3-4 student was already demonstrating success)
		    ◦ Student with LD profile is now able to use multiplicative thinking in problem solving and in group work (accountable talk and anchor charts are paramount in these improvements)
		• Due to the semester 2 turn-around, secondary data is somewhat limited. However:
		    ◦ Participated in two classroom observations of rich tasks based on "3-act-math" lessons
		    ◦ In the first class:
		        ▪ the majority of students were observed using manipulatives—including 3/3 focus students
		        ▪ many students were engaged in accountable talk, questioning, and idea-verification
		    ◦ In the second class:
		        ▪ the classroom teacher stepped out of their comfort zone in order to deliver a rich, 3-act-math lesson.
		        ▪ this growth was later exemplified by the same teacher who voluntarily explored the use of another unfamiliar teaching strategy (manipulative at the RMS day); due to this, another teacher was willing to step out of their comfort zone to build capacity with the same manipulatives
			• The team will plan to use the same pre- and post-assessment rich task in order to capture concrete evidence of student achievement in problem-solving for cycle 3.

3rd CYCLE OF INQUIRY ***Starting March 19, 2018*** *Complete this section with any new data from your 2nd Cycle of Inquiry* ***If/Then Statement: Posted by March 30, 2018*** If teachers build capacity using rich tasks and utilize assessment data to inform next intentional steps, then students will demonstrate improved problem-solving outcomes on post-assessment tasks.	***Actions will be outlined in the three learning team meetings through the "SIPSA Monitoring Template" and summarized here at the end of the cycle by June 15th, 2018.*** The team focused on using rich tasks to develop problem solving skills. The team reviewed the characteristics of rich tasks and explored various resources to access them (Marian Small Open Tasks, Differentiating Secondary Math, Edugains, Dan Meyer 3-Act Math, etc). Cycle 2 data would serve as the baseline data for problem solving for this cycle. Emphasis would be on observing students exploring rich/parallel tasks in partner/flexible groupings to talk and make meaning of the problem, collaborate on strategies/plans/use of math tools to solve the problem in hopes of improving student efficacy in problem solving. The team would then regroup to share our	***Data Gathering will be outlined and collected in the three learning team meetings through the "SIPSA Monitoring Template" and summarized here at the end of the cycle by June 15, 2018.*** The documentation of impact of intentional teaching moves was coded using the following: - end of cycle 2 data - monitoring plans - class visits - tracking of success criteria - anecdotal observations In general, we saw a definite improvement in our students' problem-solving ability. Specifically, notable gains were realized in recognizing relationships and making connections between mathematical ideas, an increased use of manipulatives (by both	***Reflections of Learning Teams work for cycle two will be summarized here at the end of the cycle by June 15th, 2018, and posted on Insite*** **Student Desk:** Considerable improvement was noted in the students' ability to: -make connections/relationships in the math -efficacy/confidence -use talk to make meaning/explain their thinking -use math tools to represent their thinking -write the equation -decreased need for teacher prompting/scaffolding Students demonstrated an upward trend in growth mindset over the year (some writing, "Never give up" at the top of tests) and perseverance during group work. Emphasis on

observations of student work and determine intentional teaching moves.

The learning goal and success criteria used were as follows:

Learning Goal:

We are learning to understand (make meaning of) word problems and how to demonstrate (show) our thinking to solve them.

Success Criteria:

I can read the question to myself or an elbow partner and talk about it.

I can visualize the problem (see it in my head).

I can use a strategy (drawing, chart, table, graph, equation, etc.) to show what I know and don't know from the question.   e.g., 2T+R=10

I can use manipulatives to help me solve it.

I can choose an operation and write an equation (+, -, x, /) to represent my thinking.

students and teachers), and an increase in the ability to represent thinking in a variety of ways. It was also noted that students required less scaffolding/prompting from their teachers by the end of the year which indicates that students were feeling more confident about completing math tasks on their own.

The following chart includes a summary of our findings:

*/bold: part of Success Criteria for problem solving	PRE - meeting 5	POST - meeting 8
Sees relationships/makes connections in the math	II	IIIII
*Use of math tools (Desmos, algebra tiles, graphs, manips, visuals) helped	IIII	IIIIIII
Prefers group work/partners/collaborates	II	IIII
Efficacy/confidence	I	IIII
Prefers independent work	II	III
*Uses talk to make meaning of problem (speaks/listens) and/or explain their thinking	IIII	IIIIII
*Shows work/representation/use of strategy	III	IIIIII
*Can write an equation in solution	IIII	IIIIIIII
Uses success criteria/anchor charts/notes	III	IIIII
Needs scaffolding/prompting	IIIIII	I

3 Focus Students were omitted from POST data (teacher was on medical leave).

this should continue with a focus on algebraic reasoning and problem-solving skills. Ultimately, the goal is for students to learn to provide conjectures, reasoning, proving, and reasonableness in problem-solving and consider how this math connects to real-world applications.

Teacher Desk:
-rich tasks can be time-consuming but have definite value in contributing to growth mindset, accountable talk, and risk-taking
-rich tasks create a thinking stance/mindset to solve rather than just "do" the math
-observations and documentation are a very large part of the process in determining student progress; continued development in becoming more efficient in this area will be a goal for next year.
-continued work in balancing knowledge/facts/procedures with rich/open tasks
-continued practice "naming the math" to become more intentional in assessment/monitoring practices (i.e., recognizing the success criteria in practice)