

Subtract the Gap

Improving Mathematics teaching
through collaboration across
Primary and Secondary schools



Acknowledgement of Country





Learning Intentions

- to highlight our understanding of primary and secondary mathematics learning experiences for students
- to explore the impacts of mathematics anxiety during transition from primary to secondary school
- to outline strategies for reducing the mathematics skills gap between primary and secondary
- to develop awareness of the challenges in mapping and implementing Mathematics 2.0 curriculum
- to provide support for planning and bridging the gaps in V2.0 implementation



2023



Rosanna Golf Links Primary School
Montmorency Secondary College
Macleod College

Where we started...

Primary

- Many AIP's focused on Numeracy
- Transition data from 6 to 7 indicates drop in Math's learning across network with varying results from 1 school to the next
- Many Primary Schools had been using the Launch Explore model and wanted to know how this translates with a more traditional Secondary model of practice

Secondary

- Capacity of students not translated to VCE results - growth drop off
- Variance in teacher judgement of curriculum levels - curriculum levels and student capacity
- Low student confidence transitioning to SC and through SC pathways

Lead, Inspire, Network

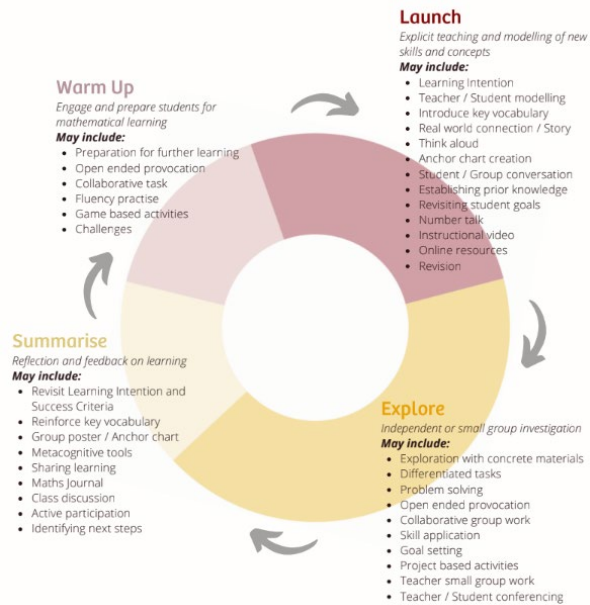


Additionally...

- Participation in BNSN & establish numeracy-focused COP on PS-SC transition focused on Math's anxiety and proficiency development
- Development of Middle Leadership through CoP of Learning Specialists/Teachers across schools (direct focused growth leadership role defined through CoP approach)

Instructional Approaches

Rosanna Golf Links



Montmorency

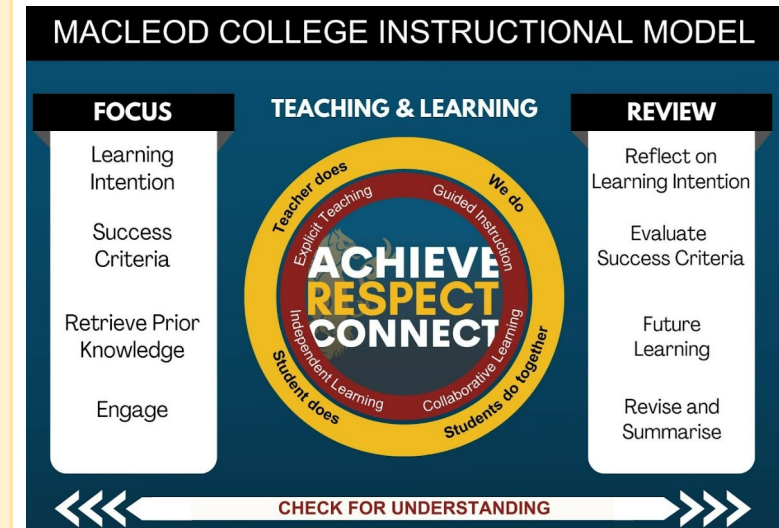
Teach

AITSL 3: Plan for and implement effective teaching and learning

AITSL4: Create and maintain safe and supporting learning environments

Lesson Sequence	Activity	HITS Structuring lessons	Literacy/Growth Mindsets
Do Now	Revision questions/hook	Multiple exposures	
Goals	Learning Intentions from Jacaranda	Set goals	Everyone can achieve
I Do	Explicit instruction on lesson content (no questions)	Explicit teaching	Read aloud
We do	Worked examples in different contexts	Worked examples Metacognition Questioning Feedback	Multiple representations Reciprocal reading Value questions Celebrate mistakes Use problem-solving strategies (bookmark)
You do	Student work time – differentiated tasks on Jacaranda - Supercourse groups for extension/support; worksheets Formative assessment	Differentiated teaching Questioning Feedback Collaboration	
Evaluate	Assess achievement of learning goals	Metacognition Multiple exposures Feedback	Everyone can achieve

Macleod



COP 2023

Context

Wonderings?

- Difference between PS and SC environment and experiences
- How we can ensure student growth from PS to SC - ensure a smoother transition
- To what degree the proficiencies are embedded in teaching and learning
- The balance of inquiry-v-explicit teaching and learning
- Factors contributing towards Math's anxiety at SC
- Why the stakes seem so much higher in Math's at SC compared to PS

COP Goal:

- Causal inquiry to set a clear goal for 2024: problem statement: *'Student achievement in top two bands and exceeding proficiency in NAPLAN declines between years 7 and 9'*

What we observed; Learning Walks

COP MATHEMATICS LEARNING WALK

Date & Time:

School:

Year Level:

Observation Notes

Learning Intention:	Success Criteria:
Language/Vocabulary:	
Lesson Structure/Practice:	

Proficiencies

+	-	?

Learner Questions:

What are you learning about? How do you do this?	How do you feel you are going in maths and why?
How did you solve ___? What strategy did you use?	What are you expecting/hoping maths lessons in high school will be like? (Year 6)
How are your maths lessons different this year to how they were in primary school? (Year 7)	Has your confidence or enjoyment of maths changed from primary to secondary school? Why? (Year 7)

What we learned...

Primary Schools

- Primary school students had significant anxiety about the transition to year 7 as this was when math's would become harder
- While students enjoyed and often excelled using a launch explore model, there was still many thoughts that real Math's is taught more explicitly and that would be a challenge at High School
- There was a high level of Math confidence even if they were confident to articulate that Math's was a challenge
- The mindset that the productive struggle was part of the learning was clear

Secondary Schools

- Need to provide more opportunities for manipulatives, reasoning and problem-solving skill development
- Explicit instruction is valuable for understanding and fluency
- Students that may have 'flown under the radar' in PS are more readily identified
- Differentiation needs to be about learning intelligence as well as mathematical ability
- Traditional 'scored' assessments and formal learning environment contribute towards math's anxiety
- More academic style of learning resulting in more anxiety and performance pressure

What we learned...

When it comes to learning maths
I usually feel...

PLEASE CIRCLE ONE



I feel like this because:



2024

Goal: To increase student achievement in top two bands and exceeding proficiency in NAPLAN



Rosanna Golf Links Primary School
Montmorency Secondary College
Macleod College
Eltham High School
Rosanna Primary School



Our CoP focus changed...

New Curriculum...
Mathematics 2.0

Middle leadership
growth
Lead Inspire
Network

Causal Inquiry

Implementing V2.0 - Primary



Mathematics V2.0 Curriculum Breakdown - LEVEL 6 (Applied Mathematics)

MEASUREMENT					
T/W	Topic	Content Descriptor	Skills	Concepts	Learning Intention/s & Success Criteria
T2W2-3	Measurement (Metric Units)	convert between common metric units of length, mass and capacity; choose and use decimal representations of metric measurements relevant to the context of a problem (VC2M6M01)	<ul style="list-style-type: none"> Convert between units of measurement (length, mass, capacity) Use decimals to represent metric units in problems Use correct operation when converting between units Convert between equivalent measurements (e.g. 1.25 metres is the same as 125 centimetres) 	<ul style="list-style-type: none"> Make connections between the metric system and decimals recognising the equivalence of measurements, such as 1.25 metres is the same as 125 centimetres Understand that system is linked to the base 10 number system, in that each unit is a power of 10 know that a larger metric unit can be converted to a smaller unit through multiplication of the base 10 multiple of the smaller unit, and vice versa Understand the meaning of prefixes and how they alter measurements (e.g. centimetre, decimeter, kilometre, kilolitre, megalitre) 	<p>We are learning to convert between metric units of measurement (length, mass and capacity)</p> <ul style="list-style-type: none"> -I can apply my knowledge of place value when converting between metric units of measurement - I can use decimals to represent metric units - I understand prefixes used in metric units (e.g. centimetre, decimeter, kilometre, kilolitre, megalitre) - I can use the correct operation (multiplication or division) when converting between units
T3W1-3	Measurement (Area)	establish the formula for the area of a rectangle and use it to solve practical problems (VC2M6M02)	<ul style="list-style-type: none"> Establish a formula/generalized rule for the area of a rectangle through practical investigation uses examples and materials e.g. grid paper to explain how to measure area and perimeter of rectangular shapes use the area formula to calculate the area of rectangular shapes explain how to find the area of a figure that is composed of other shapes use reasoning strategies to find the area of rectangular shapes Solves problems involving the comparison of lengths and areas using appropriate units 	<ul style="list-style-type: none"> Area and perimeter are not dependent on each other Understanding the relevant units used to measure area, moving from measuring with squares to cm². Area is a two-dimensional quantity linked to covering regions using standard units such as cm² and m² and links to multiplicative thinking. Perimeter is the one-dimensional measure around a shape. It relates to measuring the boundary or distance around a closed figure, and links to additive thinking. 	<p>We are learning to establish and use a formula to calculate the area of a rectangle.</p> <ul style="list-style-type: none"> - I can use materials (1cm grid paper) to construct a rectangle. -I can record the side lengths to explain how to measure area and perimeter of rectangular shapes - I can establish the formula to solve problems involving the comparison of lengths and areas
T2W4-5	Measurement (Time)	measure, calculate and compare elapsed time; interpret and use timetables and itineraries to plan activities and determine the duration of events and journeys (VC2M6M03)	<ul style="list-style-type: none"> Interpret information from simple timetables Calculate elapsed time in hours and minutes Use a timetable to plan a trip Develop a timetable to order events Apply suitable vocabulary to describe duration Respond to problems involving time and duration using both AM/PM and 24-hour time Determine start and end times when provided with one time and duration Find the difference between two different times 	<ul style="list-style-type: none"> Interpret 12 and 24 hour time formats Understand that time is not a base-ten system i.e. an hour = 60 (not 100) mins Understand context in time, such as "losing" or "gaining" time Understand the meaning of "elapsed time" 	<p>We are learning to measure, calculate and compare elapsed time.</p> <ul style="list-style-type: none"> - I can interpret information from simple timetables using am/pm notations and 24-hour time -I can identify start and end times when provided with a timetable - I can calculate elapsed time in hours and minutes - I can use appropriate vocabulary to compare duration of two or more events <p>We are learning to interpret, use and create timetables.</p> <ul style="list-style-type: none"> - I can interpret information from simple timetables - I can use a timetable to plan a trip - I can create a timetable to order events - I can solve problems involving timetables



Implementing V2.0 - Primary



What we are learning

- Very quickly discovered that there were significant changes to content especially from Year 3 to 6
- Content increases in challenge but also increases in volume as we catch curriculum that has transferred down from Secondary and in each year level
- This caused an immediate drop in student outcomes through assessments such as Essential Assessments that were matched to V2.0 of the Victorian Curriculum
- Reporting has lost clarity, the 6 strands as 1 aggregated score has caused a little chaos in the 6 to 7 space
- Teacher knowledge and confidence is a challenge, more time has been needed to unpack unfamiliar content
- Given there was already a struggle between 6 to 7 reporting, we were needing to work with the secondary schools to address some of these new concerns, including how to ensure that there is enough explicit teaching through the primary school models of practice

Implementing V2.0 - Secondary

What we are learning

- V2.0 is more challenging than V1.0 and students will experience a period of adjustment as skills gaps are addressed - focus on explicit teaching
- Some vocabulary has changed e.g. from 'indices' to 'exponents'
- Student curriculum levels may appear to drop or stay the same as skill-gaps are addressed - communication is key
- Curriculum levels may vary each semester depending on the strands taught
- Development of cross-strand learning sequences can help ensure more content is addressed more efficiently
- Concerns about the aggregated scores, and ongoing professional trust in teacher judgements
- Yr. 7 student skills in 2025 will be affected by whether feeder PS have implemented V2.0

Implementing V2.0 - Leadership

What are we learning?

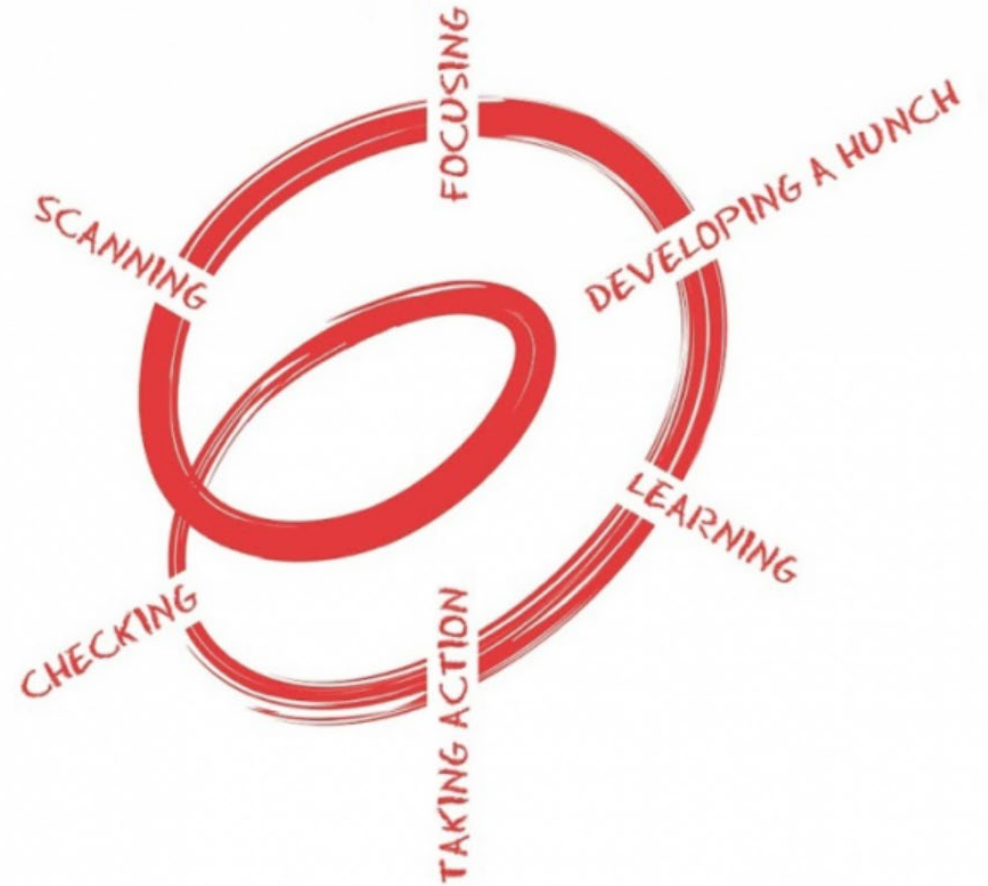
- It's taking longer than we thought unpacking the curriculum elaborations
- We need to give more time, expertise and scaffolding to the teachers developing new curriculum
- Primary School Teachers need support in developing their own Math's confidence in understanding the descriptors and what is required in a teaching and learning context
- Sharing early implementation challenges within the network allows for other schools to learn from what we are doing and plan appropriately
- Primary and Secondary Math's teachers have a lot to learn from each other, together

COP 2024 - Approach

1. Causal Inquiry

To increase student achievement in top two bands and exceeding proficiency in NAPLAN

What is happening in practice that limits the growth of our students in our Network schools?
Where does it come from? How do we address it?





COP 2024 - Approach



2. Reframe with Math's 2.0

- Identify content brought 'down' levels and identify skills gaps
- Planning days and 'backwards design' of assessment using V2.0 curriculum descriptors
- Focus on explicit teaching to address skills gaps
- Develop a process for determining aggregate curriculum levels
- Communicate with and prepare students and parents for adjusted levels

3. Network Numeracy Agenda

- V2.0 Curriculum and Reporting
- Assessment - moving towards aggregate curriculum levels
- Role of teachers in Mathematics' classrooms
- Differentiation and assessment
- Lessons plans, scope and sequence
- Exemplars

COP strategies: Implementing V2.0

What we are doing...

- Shared Unit and Lesson Plans for key Yr. 6-7 lessons involving Number and Algebra, including vocabulary and pedagogical strategies
- Conducted PS observations of SC lessons in these topics, focusing on teaching and learning activities and what the content looks like in practice to develop PS teacher knowledge of language and practices
- Trialed investigation lessons at SC focusing on reasoning and problem-solving proficiencies using proficiency rubrics
- SC staff advising PS staff on pedagogy for curriculum content areas brought down to Yr. 6 in V2.0
- Internal network PD planned for teacher-to-teacher learning about explicit Math's Concepts teaching from a secondary perspective
- Development of common vocabulary for Math's



How Principals can lead



Ensure curriculum V2.0 planning time ahead of implementation:

- Staff familiarisation with new content and vocabulary
- Identification of skills gaps and strategies to address them e.g. explicit instruction
- Backwards design of assessments
- Strategies at SC to address Yr. 7 cohorts from PS that have/not implemented V2.0
- Encourage cross-strand learning sequences
- Consider blocking at SC to enable team-teaching to better meet students at point of need

Communication with parents:

- Implications of aggregate curriculum level and its implications as well as adjustment in levels from V1.0



Workshop activity: Table Discussion



Consider the following

Where are you at with the planning / implementation of the V2.0?

What will you need to do now?

How does this impact your leadership and collaboration structures this year and next for your school context?

What does collaboration across schools look like?

Questions?

Resources to share

What we have done...

- [Scope and Sequence maps](#)
- Rubrics for assessments - [Workbook/Problem Solving](#), [Y10 Methods Quadratics Test](#)
- [Sample learning activity for V2.0](#)
- [Sample Learning Activity 2](#)
- [CoP Learning Walk Observation Sheet](#)

Thank you

