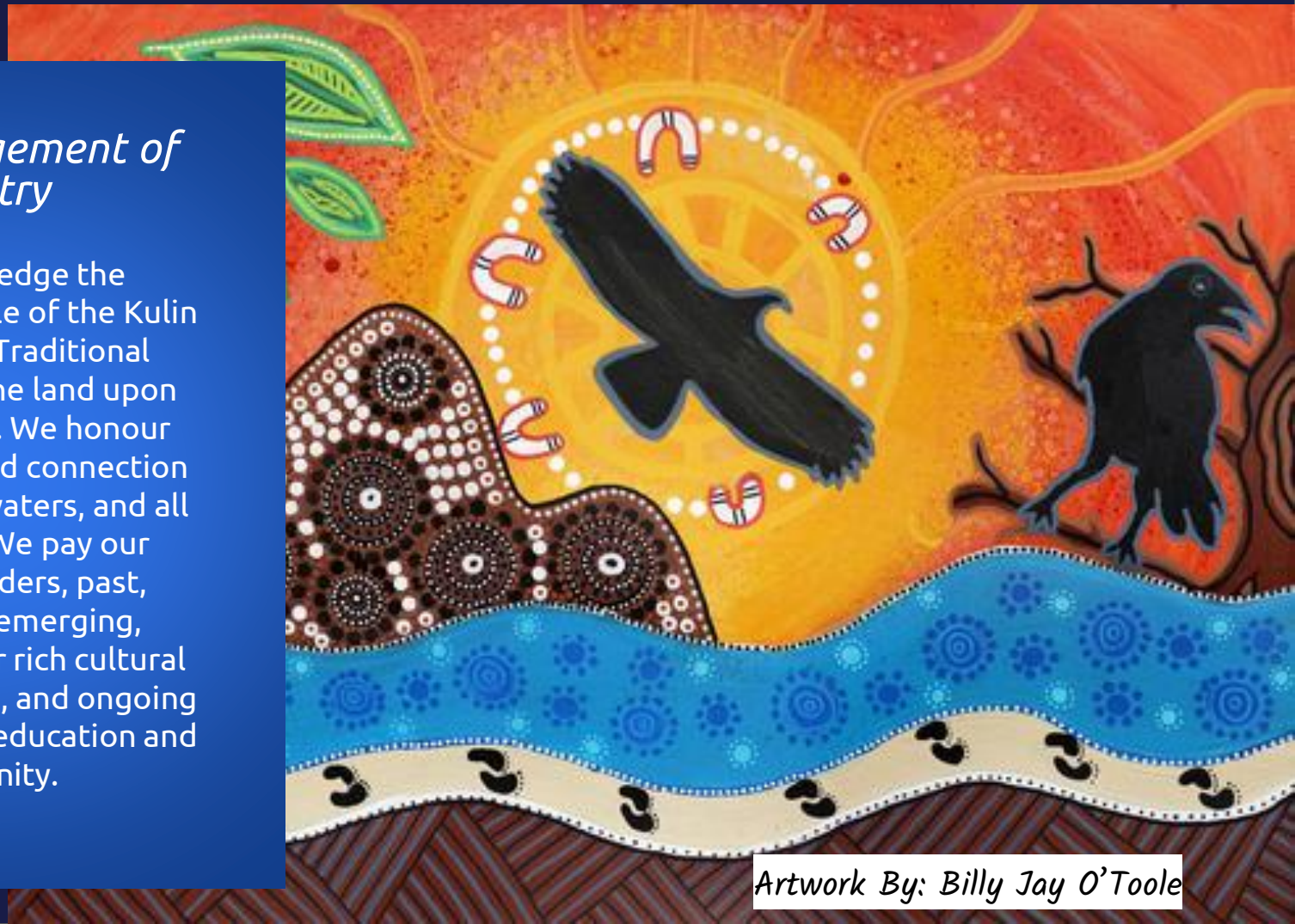
Surfside PS

Mathematics retrieval practices & active engagement

Surfside
Primary School

Acknowledgement of Country

We acknowledge the Wurundjeri people of the Kulin nation as the Traditional Custodians of the land upon which we meet. We honour their deep-rooted connection to this land, its waters, and all life within it. We pay our respects to Elders, past, present, and emerging, recognising their rich cultural heritage, wisdom, and ongoing contributions to education and community.



Artwork By: Billy Jay O'Toole

Introduction – Who we are?

Peter Walsh
Principal

Lynda Patterson
Assistant Principal

Adrian Chapman
Learning Specialist

Trina Charleston
Learning Specialist

Introduction – Who you are?

I get it!

I can tell you what I know.

I kind of get it!

I still have a few questions.

I don't get it!

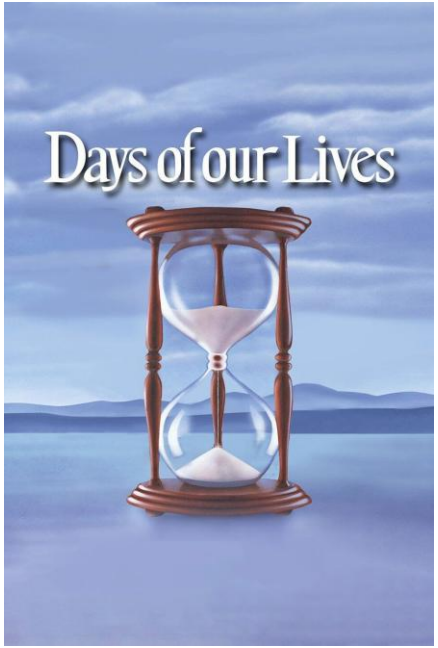
I have a lot of questions.

Professional learning norms

Be open to fresh thinking
Be professionally sceptical, but respectful
Stay focused on the topic
Know that learning and change is hard
Listen to understand
Assigned Norms Regulator

Surfside Primary School

Hourglass



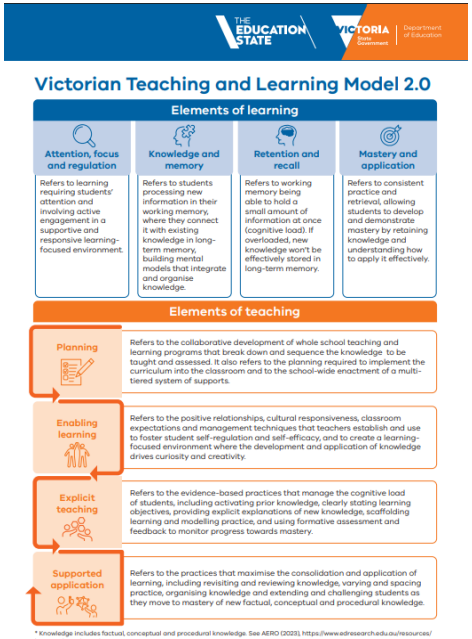
School context - Surfside Primary School

Primary - F-6	Enrolments - 542	SFOE - 0.2142
DI Level 3 - 16 (+7 2025)	EAL - 4 students	Indigenous - 5 students
Out of Home Care - 4 students	Absence 2024 - 43% of students with 20+ days	Seaside town active & involved community

Excellence in Every Classroom

IMPROVEMENT CYCLE

Evaluate and diagnose → Prioritise and set goals → Develop and plan → Implement and monitor



Victorian Teaching and Learning Model 2.0

Elements of learning

Attention, focus and regulation	Knowledge and memory	Retention and recall	Mastery and application
Refers to learning requiring students' attention and involving active engagement in a supportive and responsive learning-focused environment.	Refers to students processing new information in their working memory, where they connect it with existing knowledge in long-term memory, building mental models that integrate and organise knowledge.	Refers to working memory being able to hold a small amount of information at once (cognitive load). If overloaded, new knowledge won't be effectively stored in long-term memory.	Refers to consistent practice and retrieval, allowing students to develop and demonstrate mastery by retaining knowledge and understanding how to apply it effectively.

Elements of teaching

Planning	Refers to the collaborative development of whole school teaching and learning programs that break down and sequence the knowledge to be taught and assessed. It also refers to the planning required to implement the curriculum into the classroom and to the school-wide enactment of a multi-tiered system of supports.
Enabling learning	Refers to the positive relationships, cultural responsiveness, classroom expectations and management techniques that teachers establish and use to foster student self-regulation and self-efficacy, and to create a learning-focused environment where the development and application of knowledge drives curiosity and creativity.
Explicit teaching	Refers to the evidence-based practices that manage the cognitive load of students, including activating prior knowledge, clearly stating learning objectives, providing explicit explanations of new knowledge, scaffolding learning and modelling practice, and using formative assessment and feedback to monitor progress towards mastery.
Supported application	Refers to the practices that maximise the consolidation and application of learning, including revisiting and reviewing knowledge, varying and spacing practice, organising knowledge and extending and challenging students as they move to mastery of new factual, conceptual and procedural knowledge.

* Knowledge includes factual, conceptual and procedural knowledge. See AERO (2023), https://www.edresearch.edu.au/resources/

Surfsside Primary School's

1

Evidence-informed **approach to implementation**

2

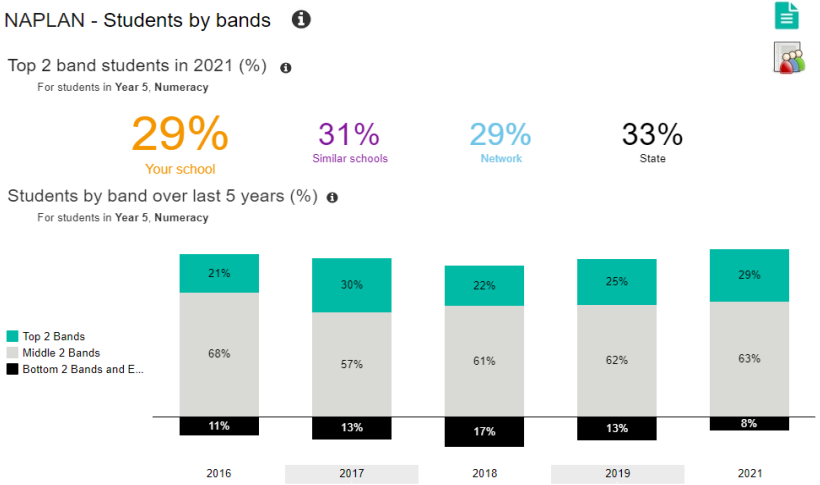
Journey into embedding **retrieval practice into Tier 1 instruction**

3

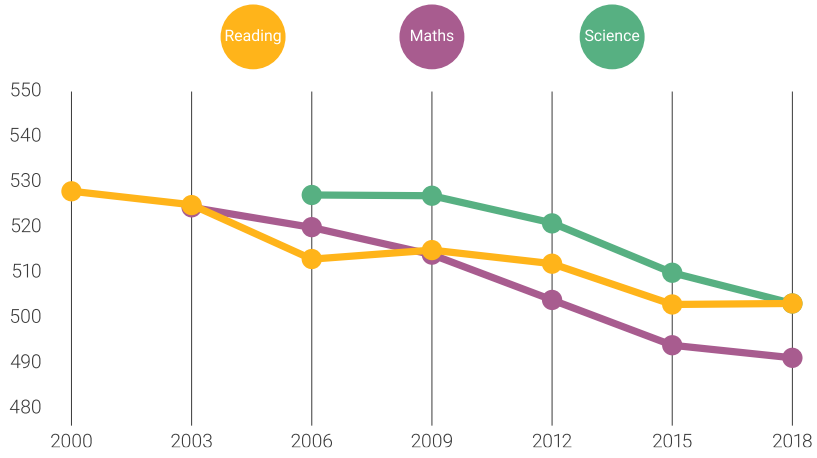
Refining of **retrieval practice** to include **active engagement**

Catalyst for change

Surfside NAPLAN

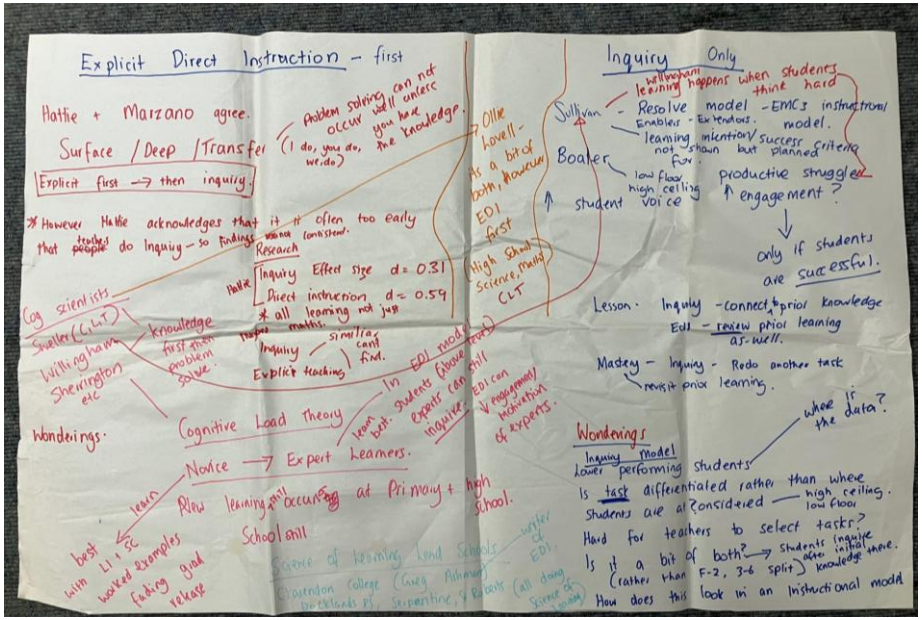


Australian PISA Scores

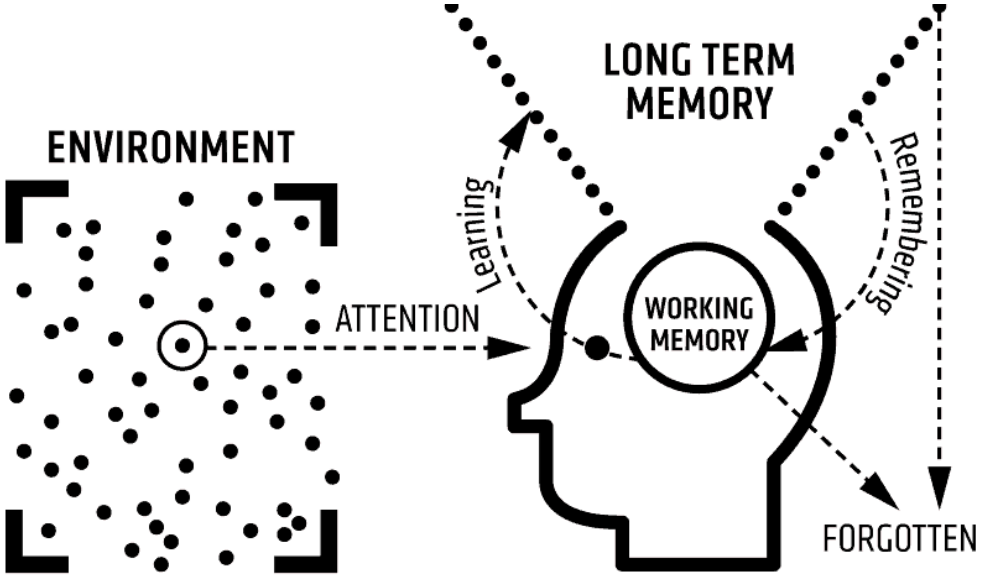


A culture of evidence & research

Adapted from Scutt, 2019



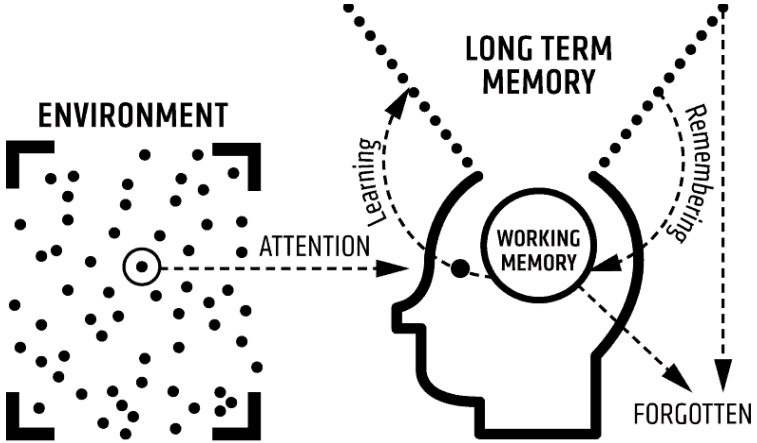
Simple Memory Model



Retrieval practice has been deemed as one of the most effective teaching and learning strategies

Dulonsky, 2013

Retrieval Practice



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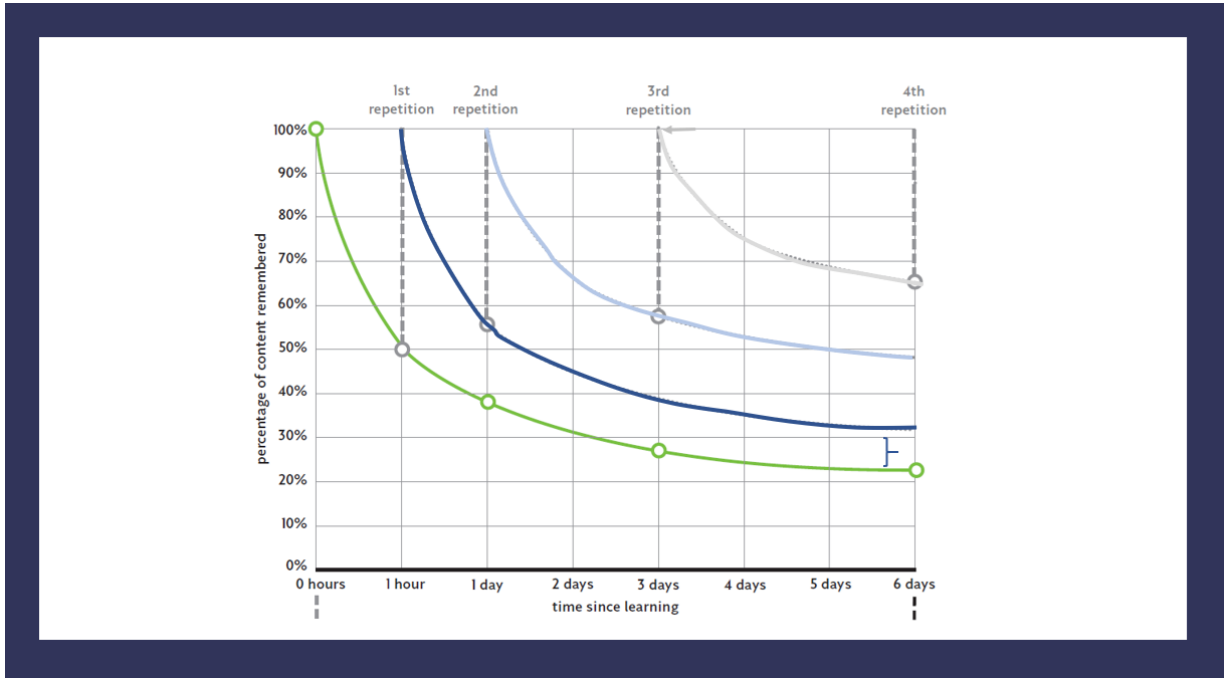
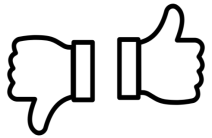
Ebbinghaus Forgetting Curve (1885)



Spaced

Interleaved

True or false

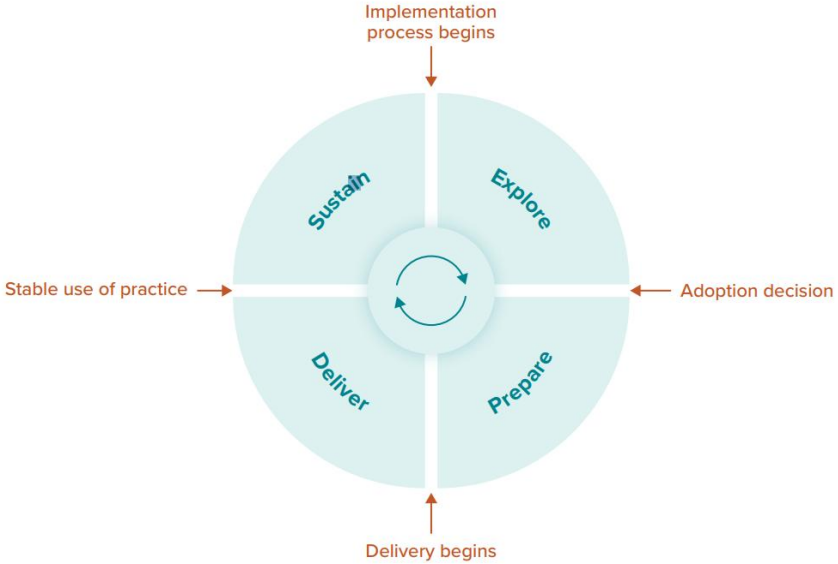
F  T

The biggest drop in memory retention occurs soon after initial learning	**T**
Working memory has a large capacity for information	**F**
The brain has a limited capacity for long term memory retention	**F**
Stress and sleep do not play a significant part in how well we retain information	**F**
A schema is a cognitive framework of interconnected ideas and concepts	**T**
The main aim of retrieval practice is to assess where students are at in their learning	**F**

"Students, I want to make sure you're learning what I am teaching"

Hollingsworth & Ybarra, 2018

Change begins with clarity at a leadership level



Leadership - 5 Year Implementation Plan for Improvement

Drives professional learning

Aligns school vision, practice & impact

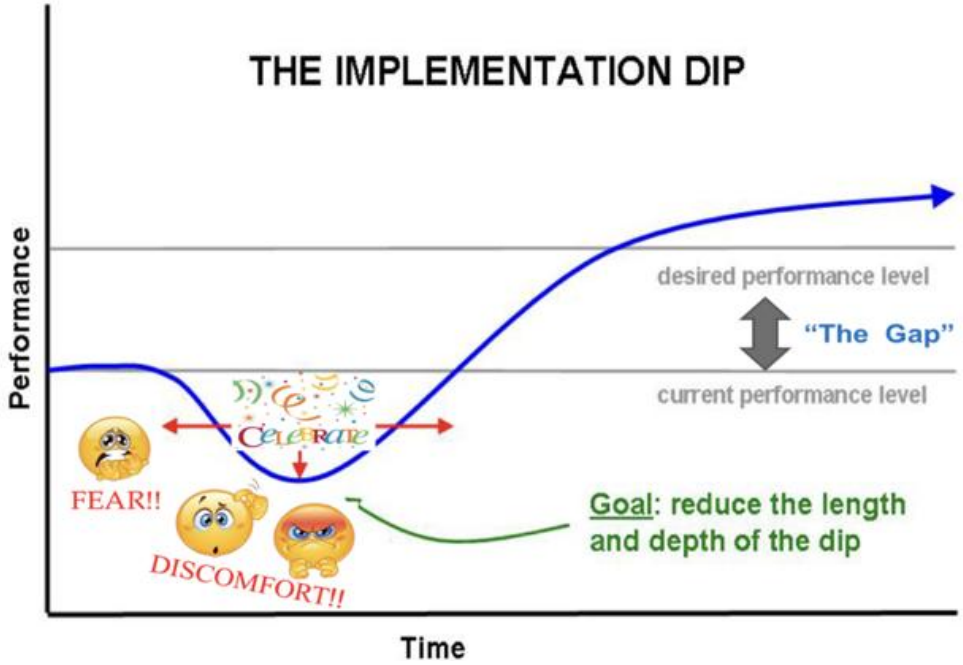
Data-driven & responsive

Change is a process

Whole-School Professional Learning to build staff capacity

PLCs to gain a deeper understanding

Coaching to embed & refine techniques



The Surfside Playbook

Organisational tool

Clear, consistent framework of high-impact teaching

Accessible

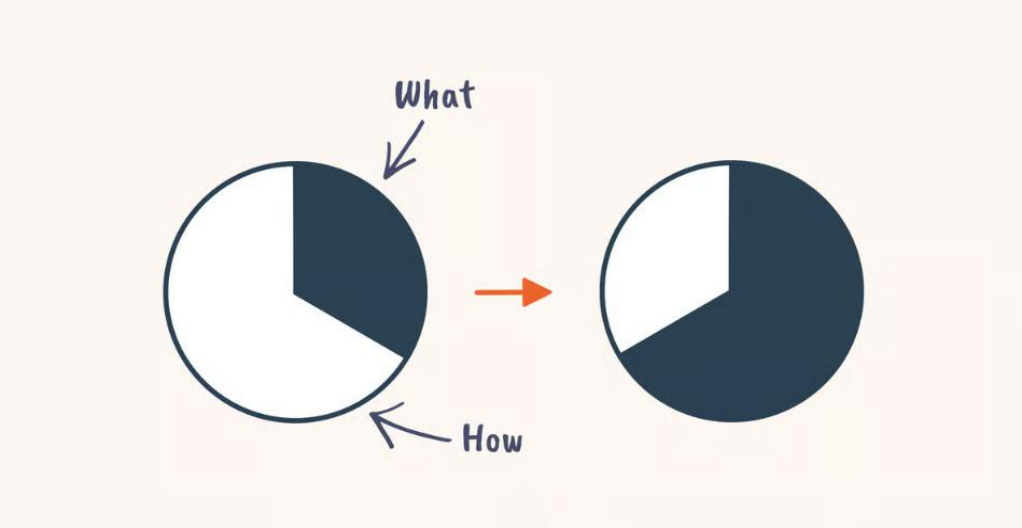
Builds collective efficacy

Theory becomes actionable

Theory behind practice

What, why & how

Creating coherence



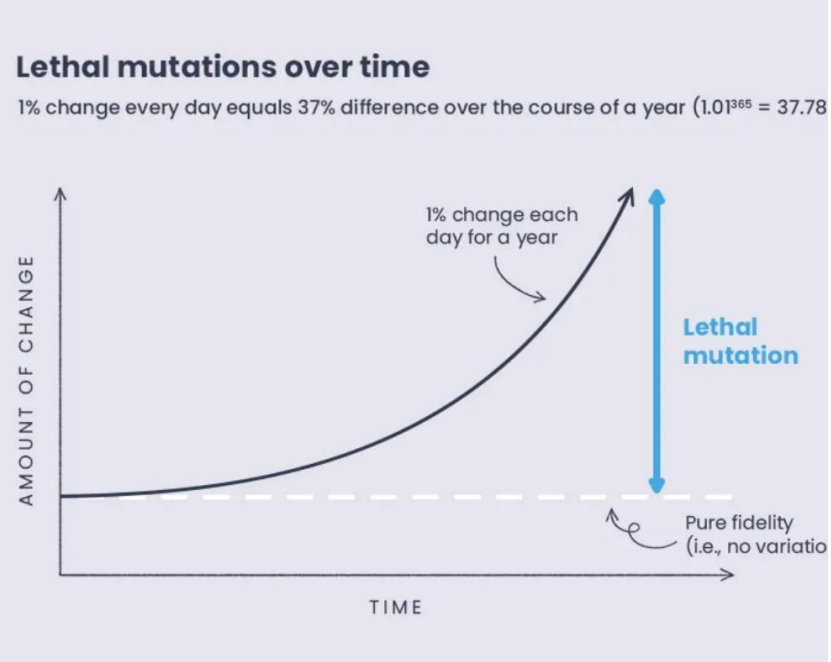
Lethal Mutation

Evidence-based practices being implemented in a way that reduces its effectiveness

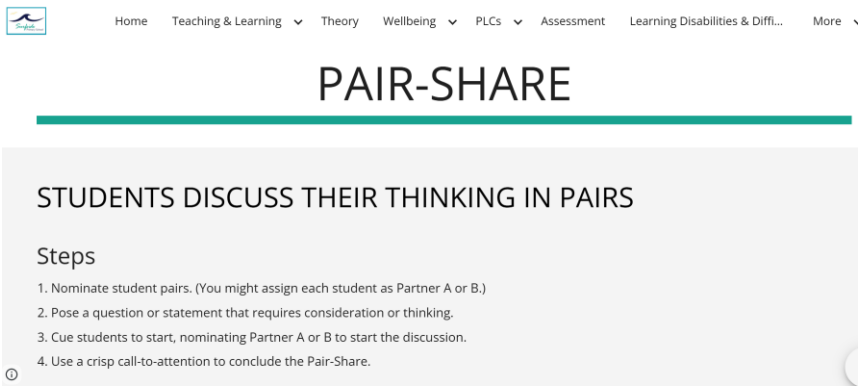
Prevention truly is better than a cure

Culture of early adopters

Strategic coaching



Consistent, predictable routines

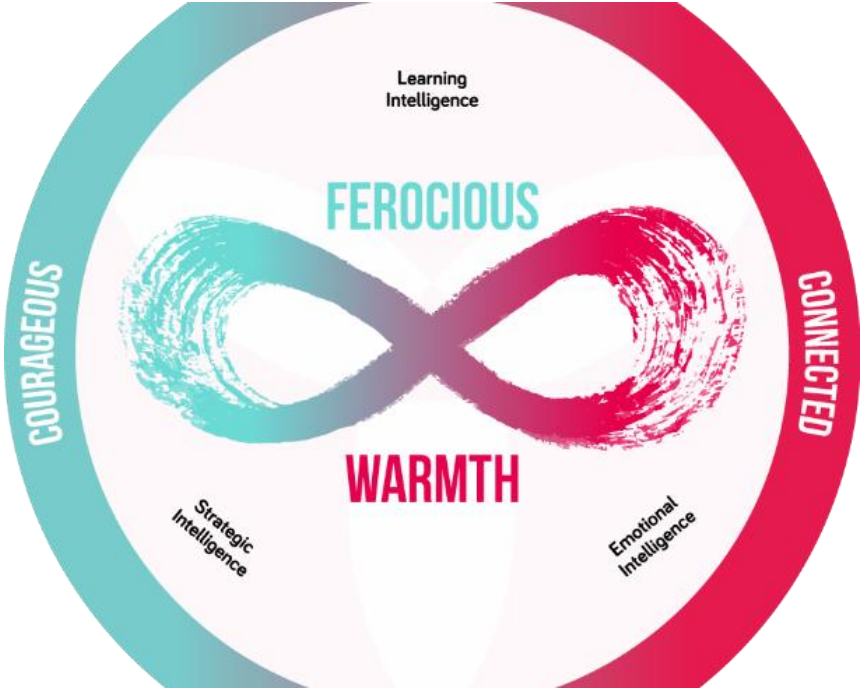


Fidelity checklists for evidence-based instructional routines for staff

Small adjustments can make significant gains

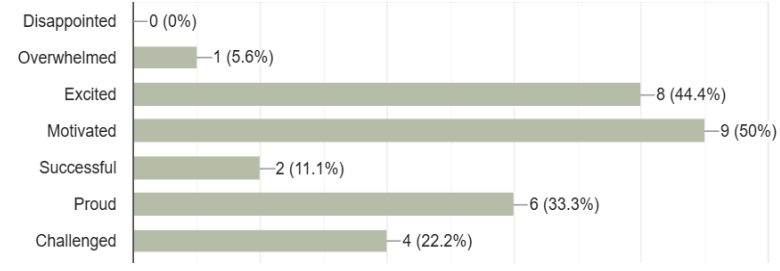
Delivery of high impact routines

Professional implementation time



1. On the scale could you please let us know how you are feeling about our WSPL focuses?

18 responses



Surveys - PIT – Pace – Stress - Support

Maintaining motivation

Being part of decision–making

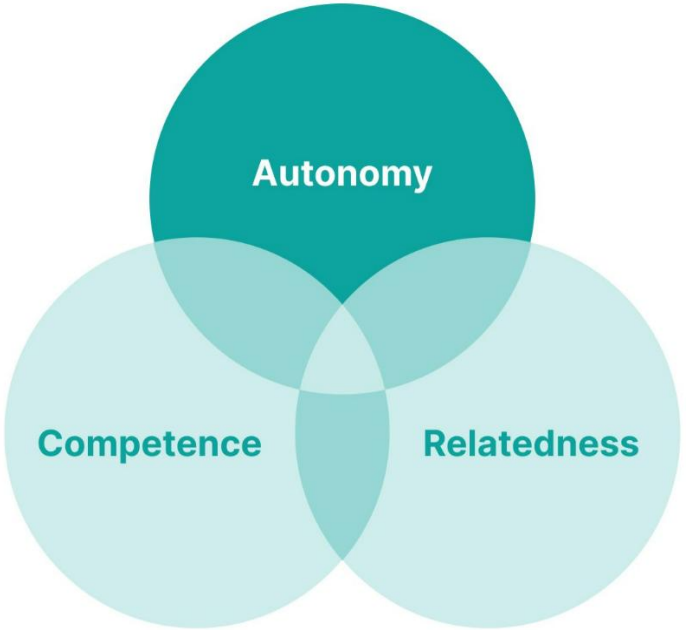
Mutually assigned deadlines

Distributed leadership

Open communication

Capacity building of staff

Staff building connections



Seeing is believing

Bridging the gap between theory & practice

Fosters a culture of continuous improvement

Abstract strategies into concrete, actionable moves for teachers

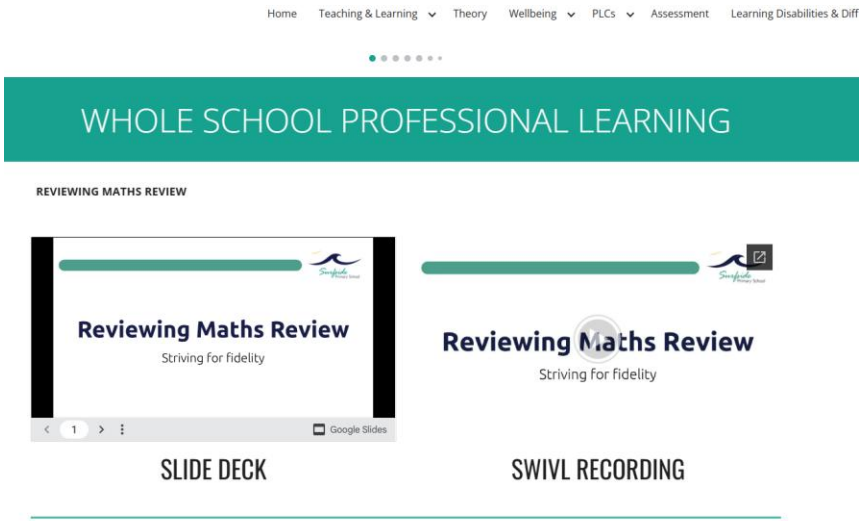
Access is equity

Equitable access to content

Professional Learning Hub

Shared expertise

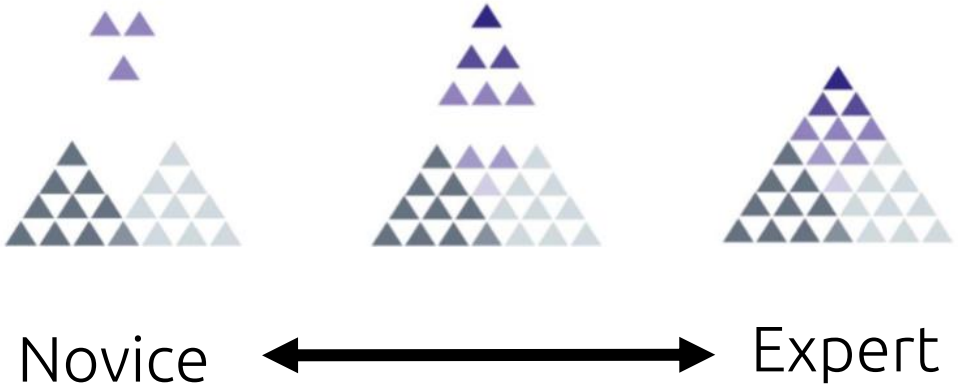
Meeting the point of staff need



Mathematics is cumulative

Mathematics is hierarchical and increasingly complex.

The role of memory, knowledge and understanding, Furst, 2021

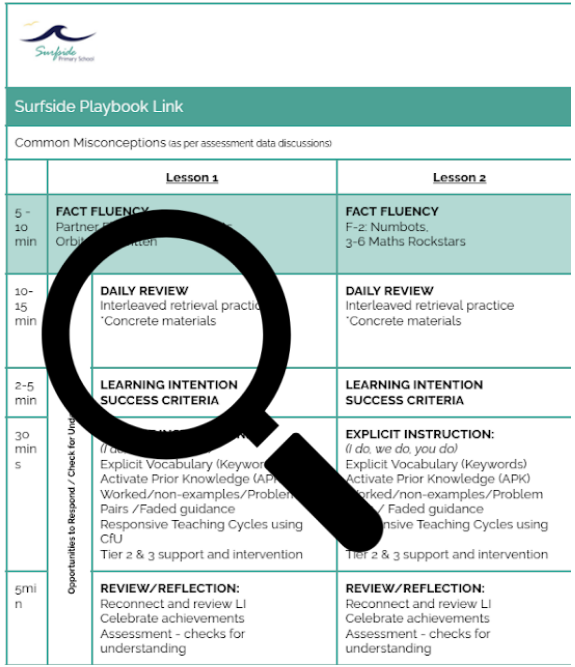


Evolution of the Instructional Model

NUMERACY BLOCK

Surfside Playbook Link						Year - Week, Term, 2024
Common Misconceptions (as per assessment data discussions)						
		Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5 - Reteach
5 - 10 min		FACT FLUENCY Partner Fluency/Rocket Facts Orbit and Written	FACT FLUENCY F-2: Numbots, 3-6 Maths Rockstars	FACT FLUENCY Partner Fluency/Rocket Facts Orbit and Written	FACT FLUENCY F-2: Numbots, 3-6 Maths Rockstars	FACT FLUENCY Partner Fluency/Rocket Facts Orbit and Written *Test for rocket facts
10-15 min	Opportunities to Respond / Check for Understanding	DAILY REVIEW Interleaved retrieval practice *Concrete materials	DAILY REVIEW Interleaved retrieval practice *Concrete materials	DAILY REVIEW Interleaved retrieval practice *Concrete materials	DAILY REVIEW Interleaved retrieval practice *Concrete materials	DAILY REVIEW/GAME: Interleaved retrieval practice *Concrete materials Interactive maths game to reflect prior concepts taught.
2-5 min		LEARNING INTENTION SUCCESS CRITERIA	LEARNING INTENTION SUCCESS CRITERIA	LEARNING INTENTION SUCCESS CRITERIA	LEARNING INTENTION SUCCESS CRITERIA	LEARNING INTENTION SUCCESS CRITERIA
30 mins		EXPLICIT INSTRUCTION: *(I do, we do, you do)* Explicit Vocabulary (Keywords) Activate Prior Knowledge (APK) Worked/non-examples/Problem Pairs /Faded guidance Responsive Teaching Cycles using CfU Tier 2 & 3 support and intervention	EXPLICIT INSTRUCTION: *(I do, we do, you do)* Explicit Vocabulary (Keywords) Activate Prior Knowledge (APK) Worked/non-examples/Problem Pairs / Faded guidance Responsive Teaching Cycles using CfU Tier 2 & 3 support and intervention	EXPLICIT INSTRUCTION: *(I do, we do, you do)* Explicit Vocabulary (Keywords) Activate Prior Knowledge (APK) Worked/non-examples/Problem Pairs / Faded guidance Responsive Teaching Cycles using CfU Tier 2 & 3 support and intervention	EXPLICIT INSTRUCTION: *(I do, we do, you do)* Explicit Vocabulary (Keywords) Activate Prior Knowledge (APK) Worked/non-examples/Problem Pairs / Faded guidance Responsive Teaching Cycles using CfU Tier 2 & 3 support and intervention	EXPLICIT INSTRUCTION: *(I do, we do, you do)* Catch up - missed lessons OCHRE Reteach Rich Task My Numeracy Additional dosage - Tier 2 and 3.
5 min		REVIEW/REFLECTION: Reconnect and review LI Celebrate achievements Assessment - checks for understanding	REVIEW/REFLECTION: Reconnect and review LI Celebrate achievements Assessment - checks for understanding	REVIEW/REFLECTION: Reconnect and review LI Celebrate achievements Assessment - checks for understanding	REVIEW/REFLECTION: Reconnect and review LI Celebrate achievements Assessment - checks for understanding	REVIEW/REFLECTION: Reconnect and review LI Celebrate achievements Assessment - checks for understanding
	NOVICE <----------> EXPERT					

Zooming in on retrieval practice



Surfside Playbook Link

Common Misconceptions (as per assessment data discussions)

	Lesson 1	Lesson 2
5 - 10 min	**FACT FLUENCY** Partner [illegible] Orbit [illegible]	**FACT FLUENCY** F-2: Numbots, 3-6 Maths Rockstars
10-15 min	**DAILY REVIEW** Interleaved retrieval practic *Concrete materials	**DAILY REVIEW** Interleaved retrieval practice *Concrete materials
2-5 min	**LEARNING INTENTION SUCCESS CRITERIA**	**LEARNING INTENTION SUCCESS CRITERIA**
30 mins	(I do, we do, you do) Explicit Vocabulary (Keywor Activate Prior Knowledge (AP Worked/non-examples/Problem Pairs /Faded guidance Responsive Teaching Cycles using CfU Tier 2 & 3 support and intervention	**EXPLICIT INSTRUCTION:** (I do, we do, you do) Explicit Vocabulary (Keywords) Activate Prior Knowledge (APK) Worked/non-examples/Problem / Faded guidance nsive Teaching Cycles using Tier 2 & 3 support and intervention
5min	**REVIEW/REFLECTION:** Reconnect and review LI Celebrate achievements Assessment - checks for understanding	**REVIEW/REFLECTION:** Reconnect and review LI Celebrate achievements Assessment - checks for understanding

Opportunities to Respond / Check for Und

A major issue in learning is the inevitable, predictable and natural process of forgetting. Unless we review what we've learned, our memory of that information diminishes: we remember fewer details, fewer connections and find it harder to retrieve what we previously learned.

245 770

Retrieval practice supports building our long-term memory and our level of fluency recall.

Tom Sherrington, 2019

Developing consistency - Fidelity checklists

FIDELITY CHECKLIST

- 10-15 minute, Tier 1 strategy prior to the EDI component of each lesson
- Inclusion of prior interleaved mathematical concepts taught to mastery
- Slide decks may be used as an instructional tool
- Consistent, predictable routines
- Opportunities to Respond (OTR) to maintain attention and engagement
  (mini-whiteboards, pause-pair-share, choral response, gestures, multiple choice, cold call, complete sentences).
  Rate: 3-4 OTR every minute
- Checks for Understanding (CfU) to inform Responsive Teaching cycles
  Rate: 1 CfU every 3-4 minutes
- 80% student accuracy with corrective feedback to close the loop
- Multisensory (Visual, Auditory, Kinaesthetic)
- Transitions (e.g. floor to tables)
- Concrete materials included with consideration of the CPA Model

Unpacking fidelity

- 10-15 minute fast-paced,

Tier 1 strategy

Unpacking fidelity

- Inclusion of prior interleaved mathematical concepts taught to mastery

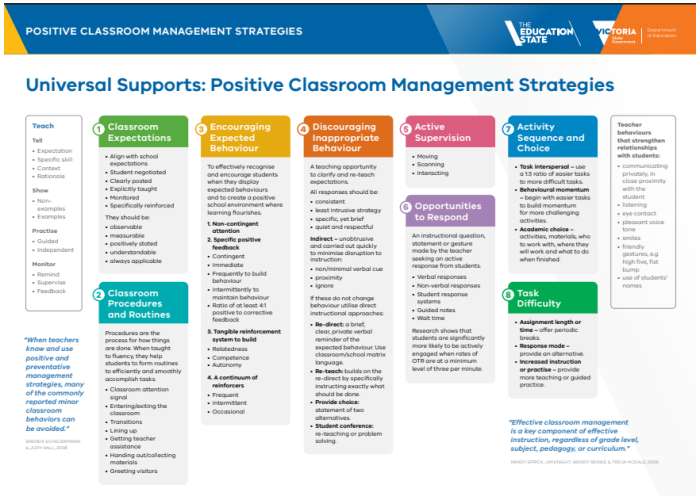
Unpacking fidelity

- Slide decks and clickers

used as an instructional tools

Unpacking fidelity

- Consistent, predictable routines



1 Classroom Expectations

- Align with school expectations
- Student negotiated
- Clearly posted
- Explicitly taught
- Monitored
- Specifically reinforced

They should be:

- observable
- measurable
- positively stated
- understandable
- always applicable

2 Classroom Procedures and Routines

Procedures are the process for how things are done. When taught to fluency, they help students to form routines to efficiently and smoothly accomplish tasks.

- Classroom attention signal
- Entering/exiting the classroom
- Transitions
- Lining up
- Getting teacher assistance
- Handing out/collecting materials
- Greeting visitors

5 Active Supervision

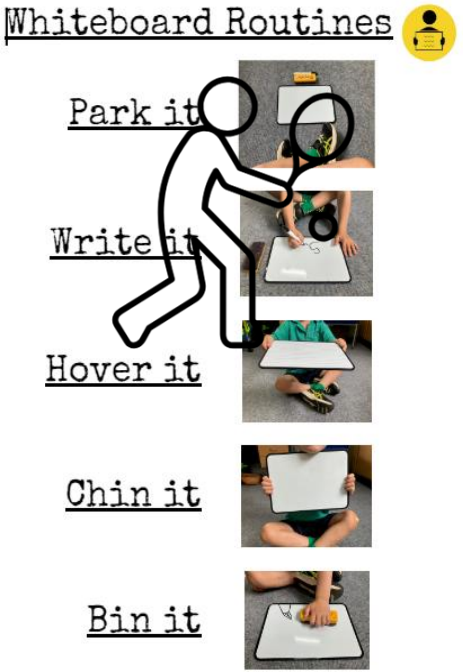
- Moving
- Scanning
- Interacting

Unpacking fidelity

- Opportunities to Respond (OTR) to maintain attention and engagement

(mini-whiteboards, pause-pair-share, choral response, gestures, multiple choice, cold call, complete sentences)

Rate: 3-4 OTR per minute



Unpacking fidelity

- 80% student accuracy through structured Checks for Understanding (CfU) with corrective feedback to close the loop

Unpacking fidelity

- Multisensory

(Visual, Auditory, Kinaesthetic)

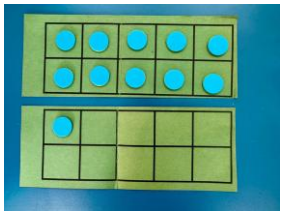
Unpacking fidelity

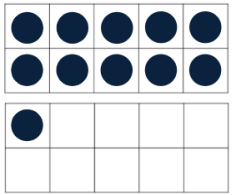
- Transitions

(e.g. floor to tables)

Unpacking fidelity

- Concrete materials included with consideration of the CPA Model





Retrieval practice in action

Turn and talk

Where to next?

Opportunities to Respond

- Increasing rates of OTRs
- Refine particular OTRs
- Move from not just OTRs but strategic Checks for Understanding

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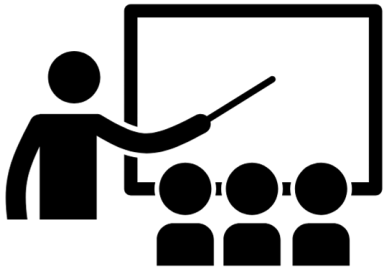
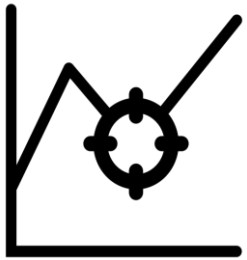
Evidence-based practice



Improved teaching capacity

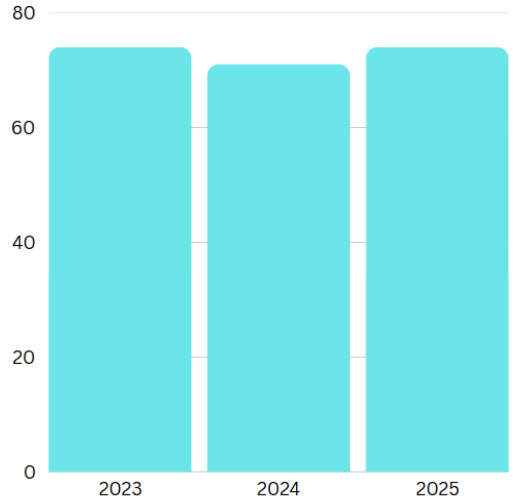


Implementation dip

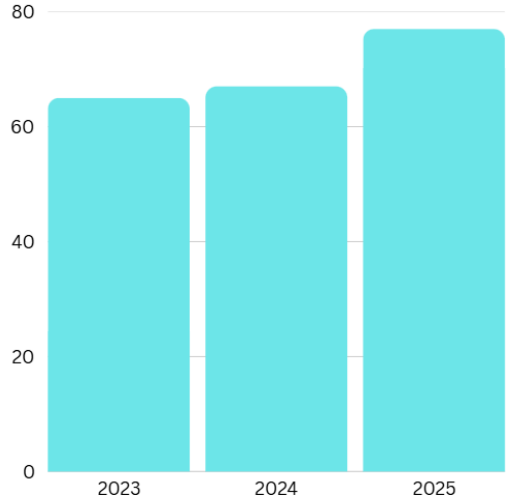
Improved student outcomes

NAPLAN data - Proficiency Levels
Strong & Exceeding (2025 - Preliminary Data)

NUMERACY YEAR 3



NUMERACY YEAR 5



Surfside Primary School

Fact fluency

Staff, student and community data

School Staff Survey

Endorsement in 2024 (%)

Professional learning to improve practice for all respondents

Your school	Similar schools	Network	State
100%	80%	88%	82%

Staff - Professional Learning

Percentage Endorsement in 2024 (%)

Sense of confidence for students in **Years 4 to 6**

Your school	Similar schools	Network	State
83%	79%	75%	77%

Student - Sense of Confidence

Percentage Endorsement in 2024(%)

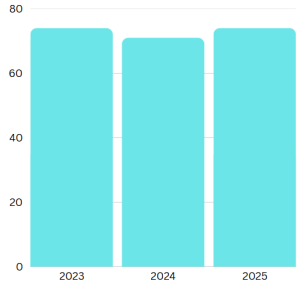
For **Student cognitive engagement - All**

Your school	Similar schools	Network	State
86%	76%	76%	79%

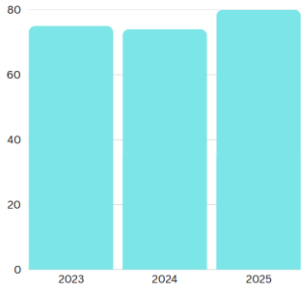
Community - Cognitive Engagement

Alignment of data

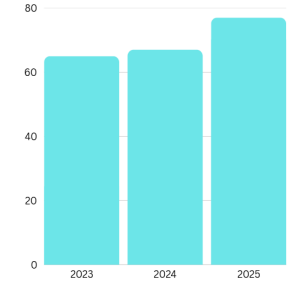
NUMERACY YEAR 3



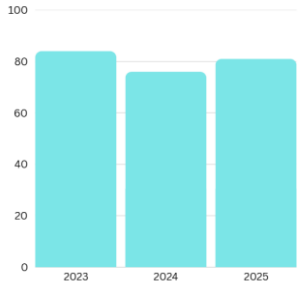
READING YEAR 3



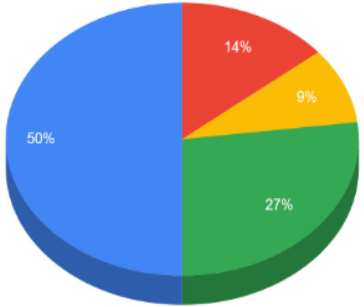
NUMERACY YEAR 5



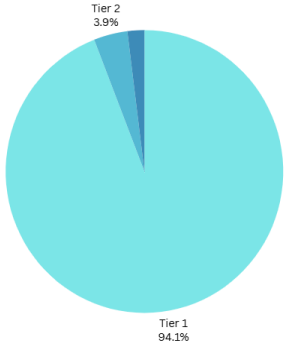
READING YEAR 5



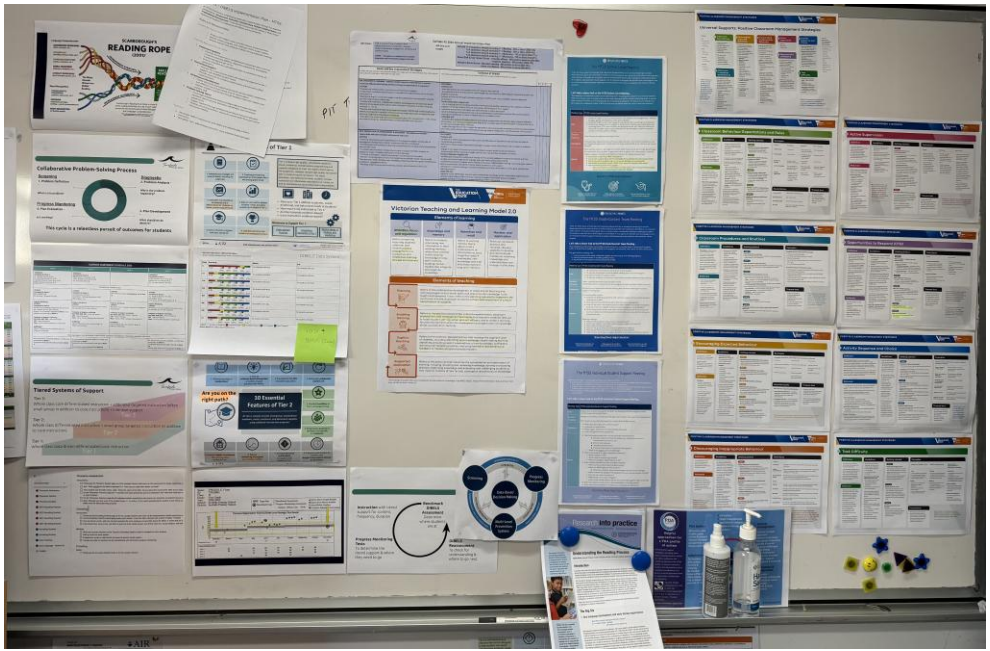
P-6 DIBELS DATA 2024



BEHAVIOURAL DATA - CHRONICLE ENTRIES



How could principals lead this work within schools?



Where to start? Position Statement

Outlines Victoria's approach to teaching mathematics and prioritises evidence-based practices aligned with how students learn.

- Implement the Victoria Teaching and Learning Model 2.0
- Ensure students have time to develop mastery
- Develop common classroom resources
- Address mathematics anxiety and build confidence
- Provide professional learning and support

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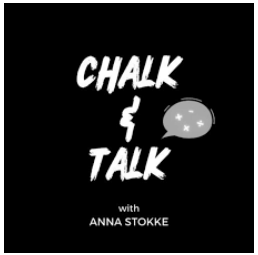
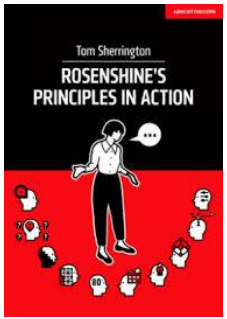
Strategies / resources / tips

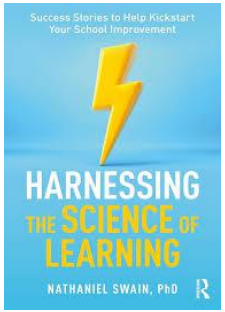
Australian Education Research Organisation

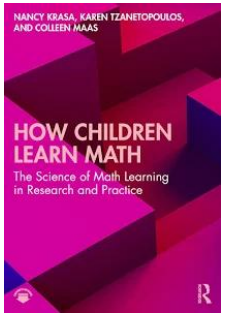


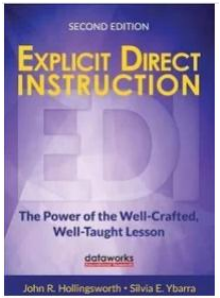
The Final Report of the National Mathematics Advisory Panel

EVIDENCE FOR LEARNING

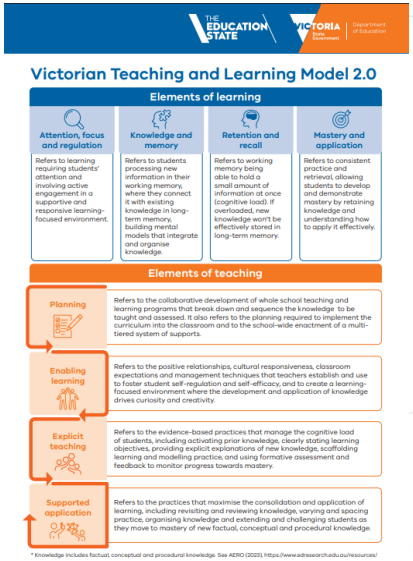


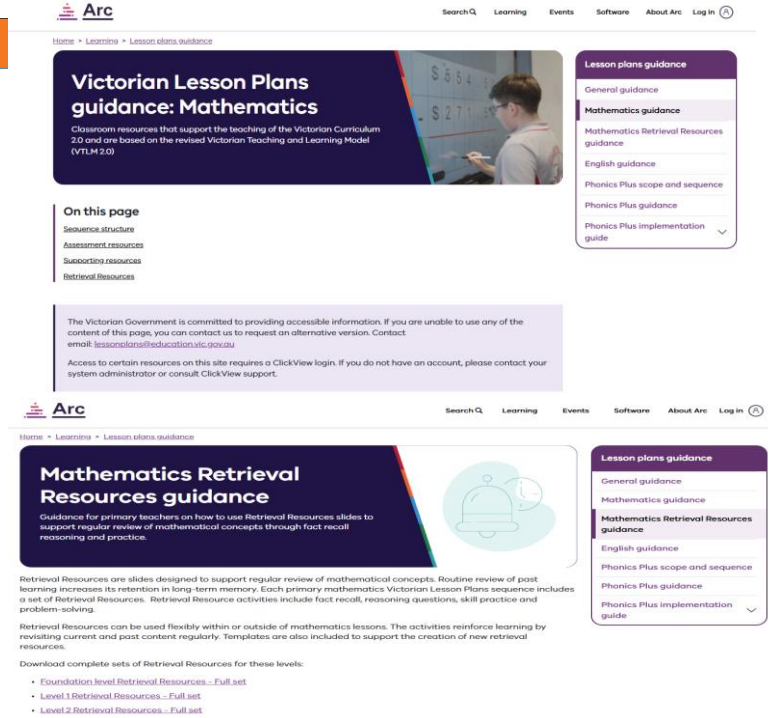






Where to start?





How to use Level 1 Retrieval Resources

This slide deck contains resources to support retention and retrieval aligned to the Level 1 Mathematics Victorian Lesson Plan sequences.

Classroom compass is a practical activity or game to support the learning focus for each sequence.

Choice check are multiple choice questions which help identify misconceptions within each sequence.

Think tank is a question to encourage reasoning, problem solving or deeper thinking supporting students to make connections within their learning.

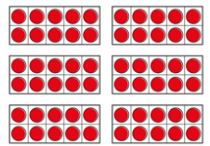
Maths memory boosters is a set of 4 carefully designed questions aimed at helping students transfer learning into their long-term memory. Each question is chosen to reinforce knowledge retention.

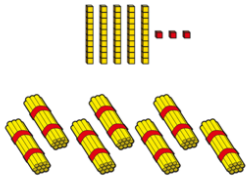
- Question 1 focuses on learning from the current topic.
- Question 2 revisits content from the previous topic.
- Question 3 targets learning from two topics ago.
- Question 4 reviews material from a previous term or year.

Is it a multiple of 10?

Show children representations of numbers, some which show multiples of 10 and some which do not.

Ask them to decide if the number shown is a multiple of 10 and to explain how they know.



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Reflection & questions?

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