CURRICULUM, PEDAGOGY AND BEYOND

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Where is the explicit teaching in Launch-Explore-Summarise?

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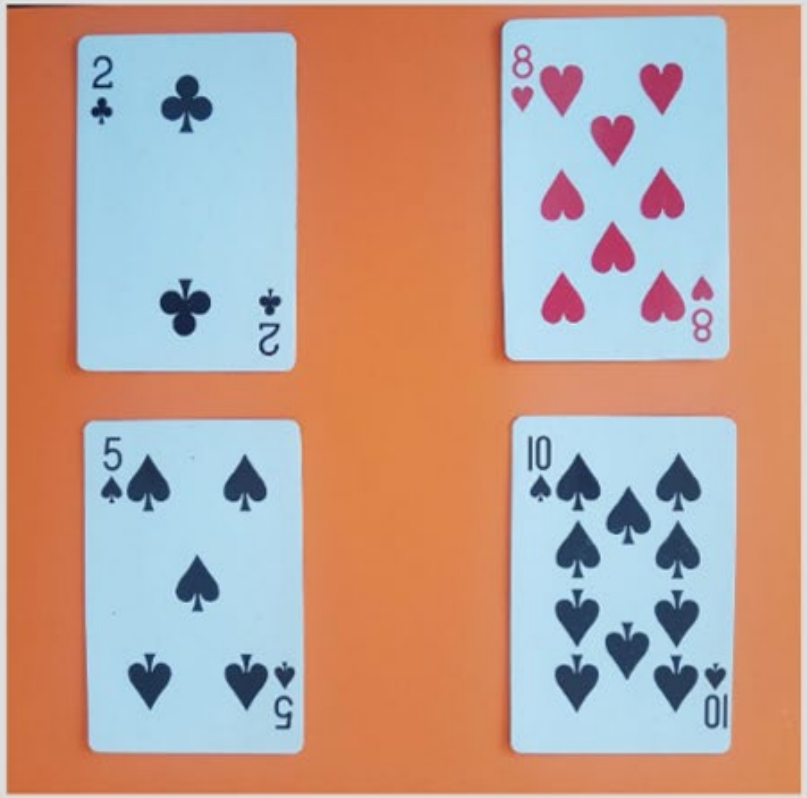
Warm Up - Pick the Odd One Out

Which one is the Odd One Out? Why?
Junior 4

PDST



https://pdst.ie/primary/stem/mathematics

Acknowledgement of Country

We acknowledge the Wurundjeri people of the Kulin Nation, as the traditional custodians of the lands on which we meet today.

We pay respect to Elders past and present, and to all First Nations people recognising them as the original and ongoing custodians of this land, which was never ceded.

We respect our First Nations peoples as the first teachers of mathematics who continue to teach us by connecting with, respecting and caring for people and country.

Welcome

ACU
AUSTRALIAN CATHOLIC UNIVERSITY

Melbourne Archdiocese
Catholic Schools

MONASH
University

VICTORIA
State Government
Education
and Training

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IN THE FOOTSTEPS OF THE LORD
ST.PATRICK'S
KILMORE

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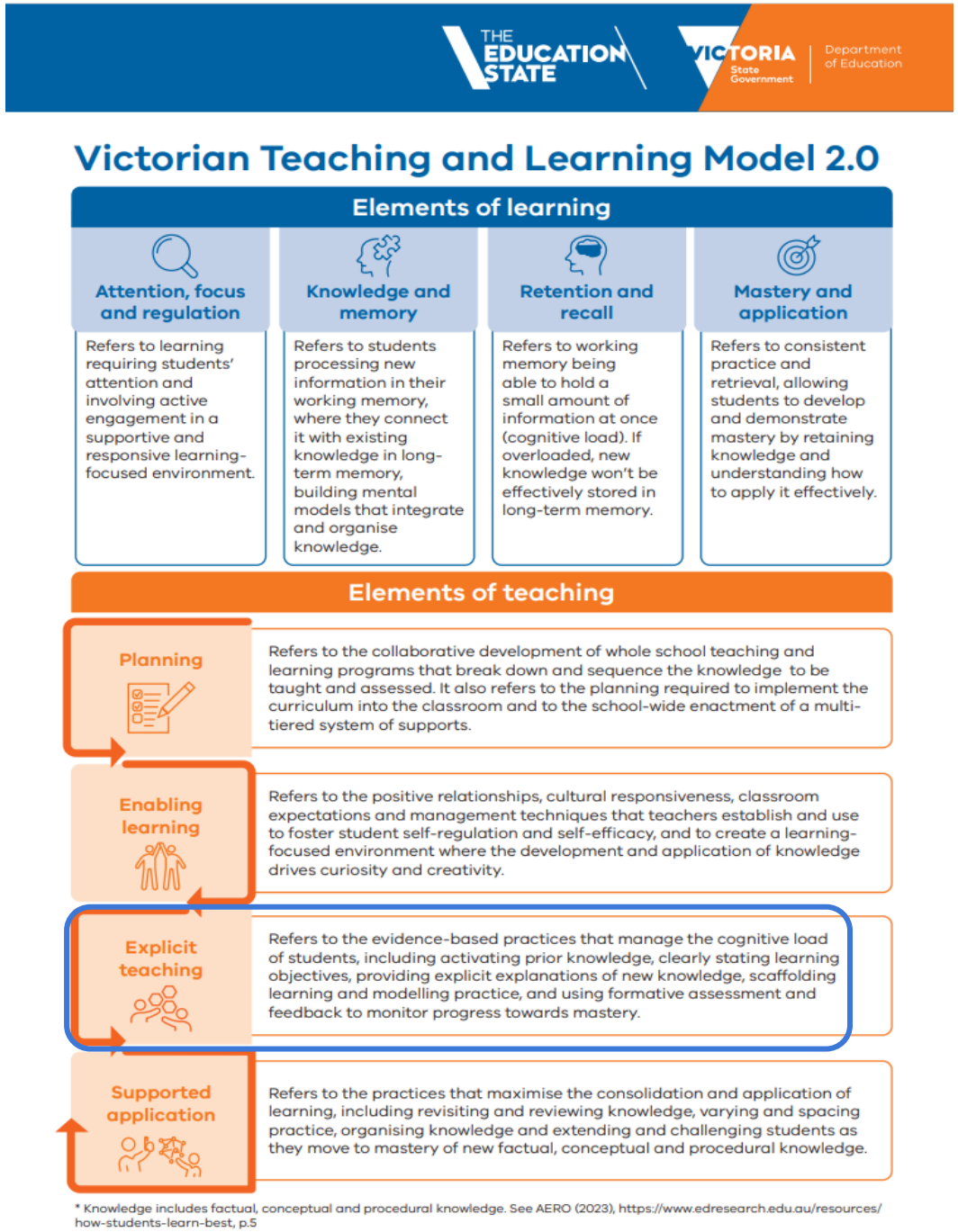
Outline for the session

- VTLM 2.0
- Victorian Curriculum 2.0
- What is explicit teaching?
- What is explicit direct instruction?
- Launch, Explore, Summarise experience
- Where is the explicit teaching in Launch, Explore, Summarise?

VTLM 2.0

What do you notice?

What do you wonder?



Victorian Curriculum 2.0

Mathematics Version 2.0

Introduction Curriculum

- Rationale and Aims
- Structure
- **Learning in Mathematics Version 2.0**
- Scope and Sequence
- Resources
- Downloads
- Glossary

Learning in Mathematics Version 2.0

Print this page

Learning in Mathematics emphasises the importance of providing opportunities for students to develop proficiency in mathematics. This development of proficiency is achieved in how content is explored or developed, that is, how students experience the thinking and doing of mathematics.

Proficiency in Mathematics

The proficiencies of Understanding, Fluency, Reasoning and Problem-solving are embedded in all 6 strands and further the development of increasingly sophisticated knowledge and understanding of mathematical concepts, fluency in representations and procedures, and sound mathematical reasoning and problem-solving skills. Proficiency in mathematics enables students to respond to familiar and unfamiliar situations by employing mathematical processes to solve problems efficiently and to make informed decisions. Proficiency in mathematics also enables students to reflect on and evaluate approaches and verify that answers and results are reasonable in the context.

Victorian Curriculum 2.0

Mathematics provides opportunities for students to apply their mathematical knowledge creatively and efficiently, sharpen their sense of discovery and develop an appreciation of structure. It enables teachers to help students to become self-motivated, confident learners through practice, inquiry and active participation in relevant and challenging experiences.

Victorian Curriculum 2.0

Aims

Mathematics aims to ensure that students:

- develop useful mathematical and numeracy skills for everyday life and work, as active and critical citizens in a technological world
- become confident, proficient, effective and adaptive users of mathematics
- become effective communicators of mathematics who can investigate, represent and interpret situations in their personal and work lives, think critically, and make choices as active, engaged, numerate citizens
- develop proficiency with mathematical concepts, skills, procedures and processes, and use them to demonstrate mastery in mathematics as they pose and solve problems, and reason with number, algebra, measurement, space, statistics and probability
- make connections between areas of mathematics and apply mathematics to model situations in various fields and disciplines
- develop a positive disposition towards mathematics, recognising it as an accessible and useful discipline to study
- appreciate mathematics as a discipline – its history, ideas, problems and applications, aesthetics and philosophy.

How do these headlines impact us?

How back-to-basics literacy and numeracy teaching transformed a struggling public school

By national education and parenting reporter Conor Duffy

7.30 Educational Institutions

Tue 26 Mar

‘We need to go back to teacher-led explicit instruction’: maths expert

Teaching methods to blame for poor maths results

Inadquate teaching methods are the main reason for low maths results in Australian students, according to a damning new report, as nearly one in three Victorian students fail to meet national standards.

Proof that direct teaching methods are best

WA is the only jurisdiction to record long-term statistically significant improvements in student NAPLAN scores at both the primary and secondary levels.

Rote learning adds up to success

Rote learning and explicit instruction are the key to children mastering the basics of reading and mathematics, a new report reveals.

Schools have been ordered to use this teaching method. Will staff comply?

What is explicit teaching?

At your tables write a definition of what explicit teaching is.

This can be done individually, with a partner or as a group.

What is explicit direct instruction?

Does this change your definition of explicit teaching?

What are the definitions?

Explicit teaching and explicit direct instruction are terms that often generate a range of interpretations, making it challenging to pin down a single, universally accepted definition.

Both approaches are generally associated with clear, structured, and intentional teaching practices where learning is made visible to students.

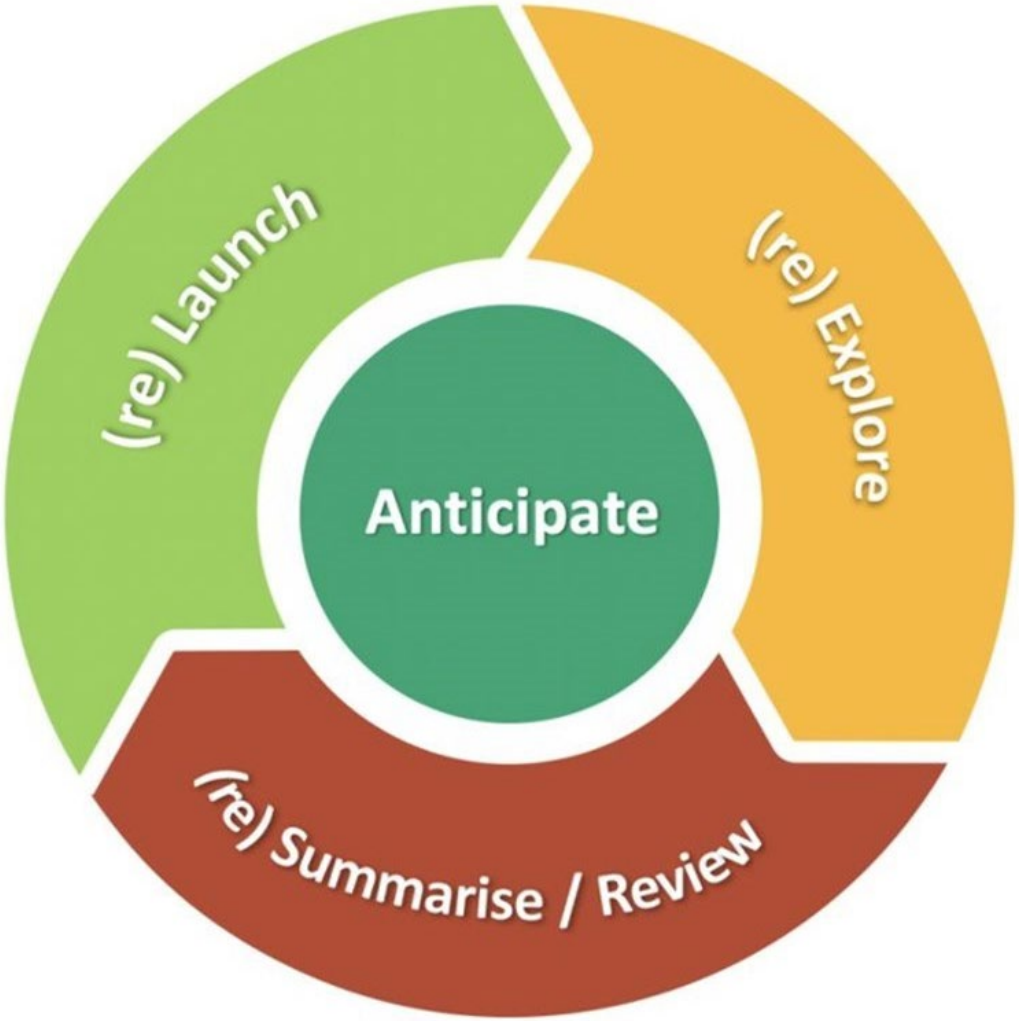
While most definitions of EDI **emphasise teacher-led instruction** with a **focus on modeling and guided practice**, using the term explicit teaching can broaden the scope to **include strategies that actively engage students in constructing understanding**.

Explicit Teaching and Explicit Direct Instruction

Launch-Explore-Summarise

A guided, structured, inquiry approach.

A cyclical model (rather than linear).

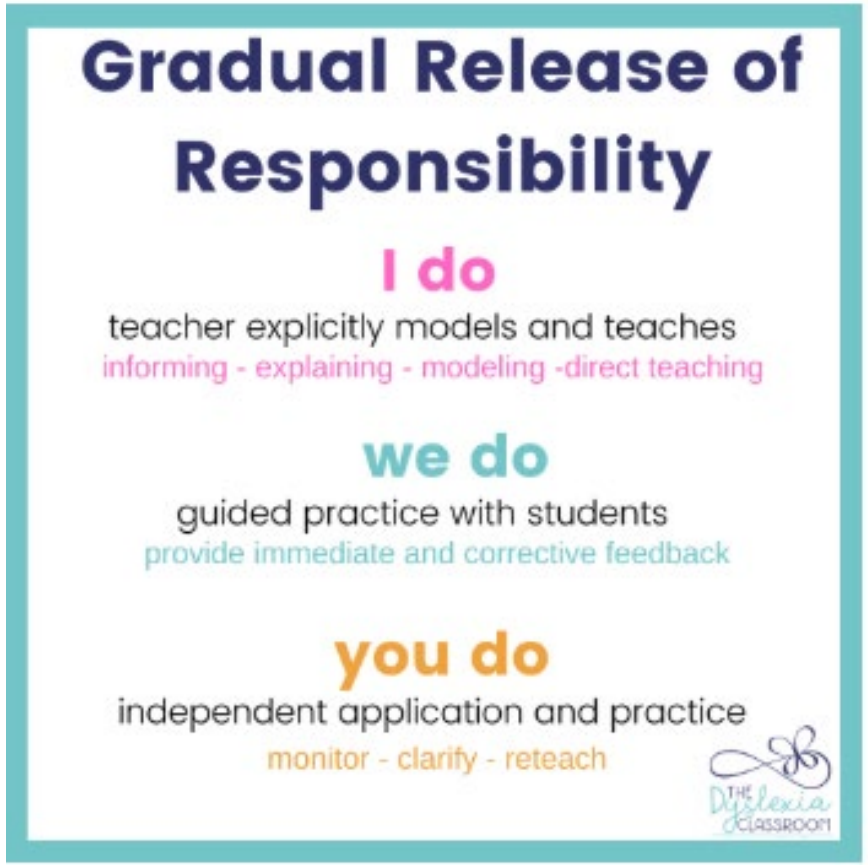


- Introduce ideas that underpin the concepts
- Pose the initial problem
- Hook students in an engaging and meaningful way

- Students are actively exploring mathematical ideas
- Teacher becomes a facilitator
- Encourage meaningful feedback and discussions
- Teacher thinking about the summary
- Teacher is scaffolding student responses for the summary
- Spotlighting student responses to guide other students

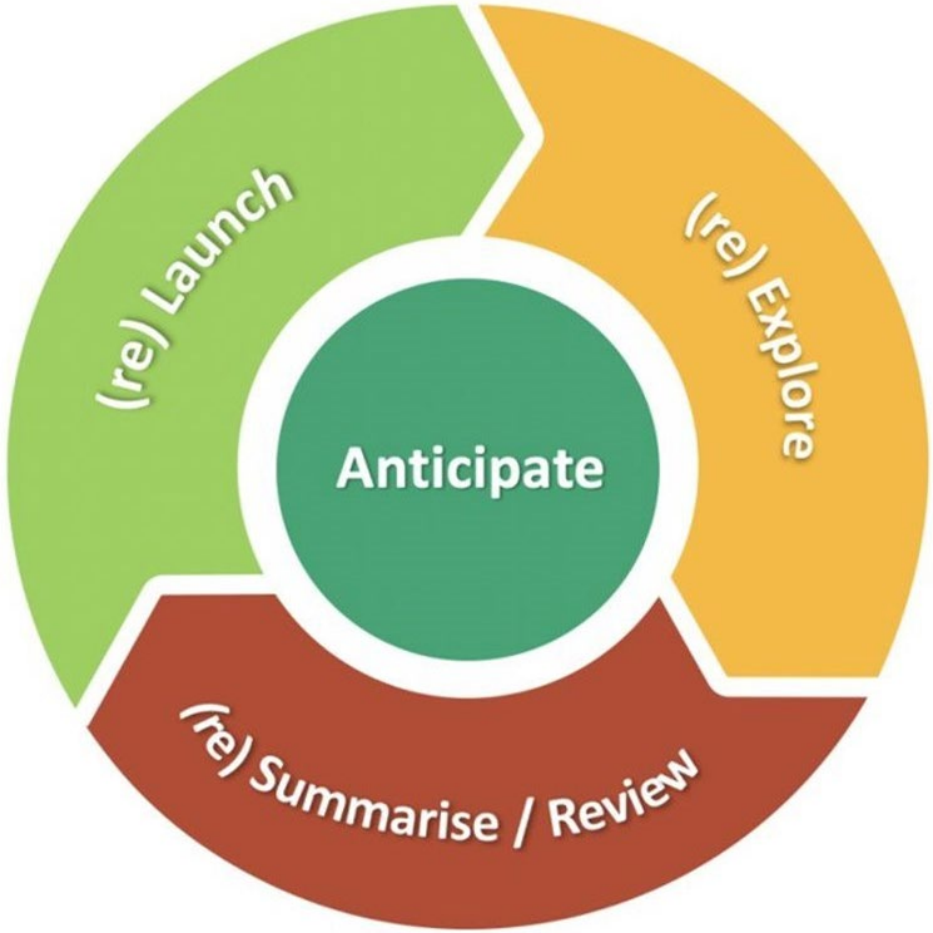
- Whole class discussion
- Outline key learning during the lesson
- Extend on the initial learning
- Students and teachers work to solve the problem
- Explicit teaching
- Lay the groundwork for future learning/problems
- Teacher to summarise key learning

Example of an EDI lesson structure



https://www.thedyslexiaclassroom.com/blog/top-reason-to-use-an-explicit-instruction-model

Example of a Student Led lesson structure with explicit teaching within the lesson



Pedagogical considerations

Explicit Direct Instruction

Student led Inquiry

So where is the explicit teaching in a Launch, Explore, Summarise Lesson?

Let’s try a lesson together and as you experience the lesson, consider when and how explicit teaching could happen.

Task:

OBJECTS WITH 12 FACES

Using small cubes, make some objects that have exactly 12 faces.

Where in this lesson is the explicit teaching?

- What opportunities were there for explicit teaching in this lesson?

Where in this lesson is the explicit teaching?

Lesson Sequence/ Date	LI and SC	Launch *No instructions. Clarify key language. Create story context - if appropriate.*	Explore *Students initially engage with tasks independently. Teacher roams looking for examples to illustrate possibilities and stimulate learning.*	Summarise *Questions to stimulate discussion and draw out mathematics. Sequence work samples to connect key mathematical ideas and build understandings.*
1	LI: We are learning to identify the face, edge and vertex of a 3D object so that we can articulate the properties of many 3D objects using correct mathematical vocabulary. SC: I can define face, edge and vertex. I can create 3D objects that have 12 faces. I can describe and explain the properties of a 3D object.	**Task:** Objects with 12 faces. Using small cubes, make some objects that have exactly 12 faces.  **Anticipated Responses:** - Students will think that each face of each cube is counted as 1 - misunderstanding that a face is a continuous flat surface, not individual surfaces -double count faces -leave out the bottom face -unsure of the language of edge, vertex/vertices -blocks half on/half off each other counting as a face I assume that students already have experience with: - 3D objects - Creating 3D objects - Perspective	**Enabling Prompts:** Create an object with 10 faces. Count the vertices, count the edges and record. Make another representation. **Extending Prompts:** Create a table listing the amount of faces, edges and vertices for each representation. What stays the same, what changes? Why? **Observe how students are:** Collaborating and problem solving Using strategies to count and keep track of the amount of faces/edges/vertices Using vocabulary to describe the properties of the object **Spotlighting:** - Miscount of faces - Same amount of faces, different representation - Correct use of vocabulary to match properties - Table of results - Generalisations **Questions to stimulate learning:** - Is that the only way it can look? Why do you think that? - Would adding/taking away blocks change the amount of faces? Is that always true? Why/ why not? Can you check that? - What directly affects the amount of faces? (Position of the cubes) - What is a face? Can you use your finger to outline the faces on your object? - Are any of the cubes overlapping? How does that affect your count of faces? - How many edges does your object have? Can you count them and describe where they are? - What is a vertex? Can you point to each vertex on your object? How many vertices does it have?	**Key Questions:** What words can be used to describe the properties of 3D objects? How would you explain the properties of your object to someone who hasn't seen it? What did you discover about objects with 12 faces? **I want students to…** Use the correct language to describe their object: - Faces - Edges - Vertices Problem solve to find multiple solutions.

Where in this lesson is the explicit teaching?

- Learning intention and success criteria
  - By outlining what students are expected to learn and how they can demonstrate success, these tools provide a clear focus for both teaching and learning. They guide instruction, help students monitor their progress, and ensure that every activity aligns with the intended outcomes, fostering a sense of purpose and direction throughout the lesson.
- Enabling and extending prompts
  - Adjust the experience based on student needs. These prompts ensure every student engages with the task in a way that best supports their learning progression.
- Spotlighting
  - Spotlighting provides 3–4 opportunities throughout the lesson to regroup the class, redirect focus, and deliver explicit teaching that builds directly on students' work. These moments are pre-planned to align with the lesson’s learning intentions and success criteria, ensuring that they effectively highlight key strategies, clarify misconceptions, and reinforce understanding. By centering these discussions around student-generated examples, spotlighting makes learning relevant and connected to the class's shared experiences.

Where in this lesson is the explicit teaching?

- Questions to stimulate learning
  - These allow for individual or small group moments of explicit teaching, tailored to the students' current point of need. They prompt reflection, clarify misconceptions, and direct students to the next stage of learning by encouraging exploration, reasoning, and connection-making specific to their needs.
- Summarise - Key Questions
  - An opportunity to share student work that demonstrates strategies that others can learn from. The teacher selects the work from students to be the best teaching points and uses it during the **summarise phase** to consolidate key mathematical ideas. This phase focuses on making connections between strategies, highlighting efficient or generalizable methods, and ensuring all students align their understanding with the learning intention and success criteria.

Where would you see these elements in a Launch, Explore, Summarise lesson?

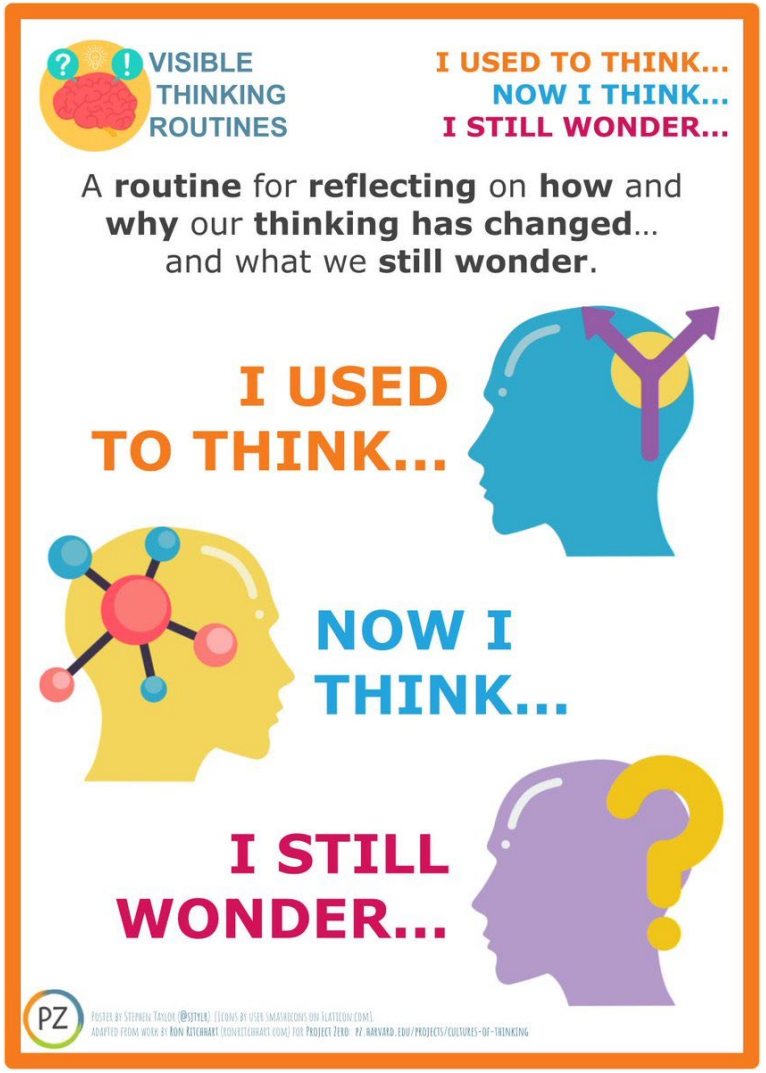
	1 Planning	2 Learning needs	3 Questioning	4 Dialogue	5 Modelling	6 Feedback	7 Connection
Anticipate	✓	✓					
Launch	✓	✓	✓				✓
Explore		✓	✓	✓	✓	✓	✓
Summarise	✓			✓	✓	✓	✓

Personal Reflection Time

I used to think….

Now I think….

I still wonder….



Additional Resources

[Click here to listen to the podcast!]

Additional References

TEACHING MATHEMATICS IN VICTORIA

David Howes, Department of Education (Victoria), and Jen Bowden, MAV CEO

CONT. FROM PAGE 1.

Sadly, polarising instructional debates, seem to be undermining teachers' professional expertise and right to choose from a variety of pedagogies that can meet their students' learning needs. Together with the MAV Board, I have been reading widely to self-educate about the origins of these debates and the reasons why reputable mathematics education researchers are concerned about naming any one instructional practice as 'best'.

As part of my commitment to gather and reflect critically on a range of perspectives, I recently met with Deputy Secretary Dr David Howes to discuss our state's mathematics achievement data, the need to support teachers working in and out-of-field in mathematics classrooms, and the strategies he believes can help to deliver more equitable and excellent outcomes for all students. David's insights follow here:

The level of mathematics attainment across all school sectors in Australia, including Victoria, should be a matter of collective focus.

The 2024 NAPLAN results were pleasing to the extent that in Victoria we did see the mean numeracy scores go up (albeit very marginally!) from the 2023 results for Years 5 and 7. But this was offset by a slight decline in the results for Years 3 and 9. See Figure 1.

The improvement in Years 5 and 7 was pleasing, even if it was marginal, because it reversed the trend of either stagnation or steady decline in our numeracy performance.

But one of the most concerning aspects of our current attainment levels in mathematics remains, which is the performance gap between advantaged and disadvantaged students. See Table 1.

Numeracy	All students		Disadvantaged students*	
	2023	2024	2023	2024
Year 3	417.7	413.4	362.3	359.3
Year 5	494.3	497.3	435.4	438.7
Year 7	544.0	545.5	481.1	483.5
Year 9	574.0	571.1	519.7	512.2

*Table 1. 2024 NAPLAN results (*as defined by lower parental education attainment.)*

These challenges are not unique to Victoria – they are evident across all jurisdictions in Australia. But they are challenges that we in Victoria need to address.

The Minister for Education and Deputy Premier, the Hon Ben Carroll, recently announced revisions to the Victorian Teaching and Learning Model (VTLM). These will have implications for the way mathematics is taught in Victorian government schools.

While the revisions reflect the practices in teaching mathematics already in place in many government schools, for others alignment with the revised model will require a shift in current practice. The revised VTLM is shown on page 5, and can be downloaded online.

The foundation of the revised VTLM is a model of *learning* because an effective model of teaching depends on a common, evidence-based model of learning.

The revised VTLM, which has drawn substantially on recent similar work by the Australian Education Research Organisation (AERO), sets out four key elements that constitute and enable the learning process:

- Attention, focus and regulation
- Knowledge and memory
- Retention and recall
- Mastery and application.

It then sets out four elements of effective teaching.

1. Planning calls out the importance of a whole-school approach to teaching and learning. This means a collaborative approach is taken to developing a common teaching and learning program, and this program is then followed consistently by all teachers in a school.

Underpinning this is a basic proposition that the collective expertise of teachers in designing a common teaching and learning approach is likely to be more effective for more students than multiple programs designed by individual teachers working alone.

This does not diminish the professionalism or expertise or agency of individual teachers. Because whatever program is developed, there will always be students who either learn at a quicker or slower pace than most of their peers.

This is precisely where the expertise and agency of individual teachers is most effectively deployed, in making the countless micro-decisions each day about what intervention will best support this particular student in this specific context at this exact moment in time.

2. Enabling learning foregrounds the necessary – albeit not sufficient – condition of effective teaching which is an enabling classroom environment for learning that develops students' capacity for self-regulation and supports the development of student efficacy.

3. Explicit teaching is the key point of connection between learning and teaching. Explicit teaching involves collaborative planning to ensure the teaching and learning is both effectively sequenced – including, for example, concrete to pictorial to abstract progressions – and paced to reduce the risk of cognitive overload and consequent confusion and learning frustration.

Explicit teaching does not mean there is no place for inquiry-based learning and problem solving.

It certainly does not mean there is no place for supporting and enabling student curiosity and reasoning and questioning. But it does mean that privileging the importance of planning to ensure students first develop an understanding of the concepts and procedures they will need to use to investigate and propose solutions to a range of problems before they are presented with the problem.

4. Supported application, that critical opportunity for students to apply their new knowledge to a wide range of increasingly complex problems.

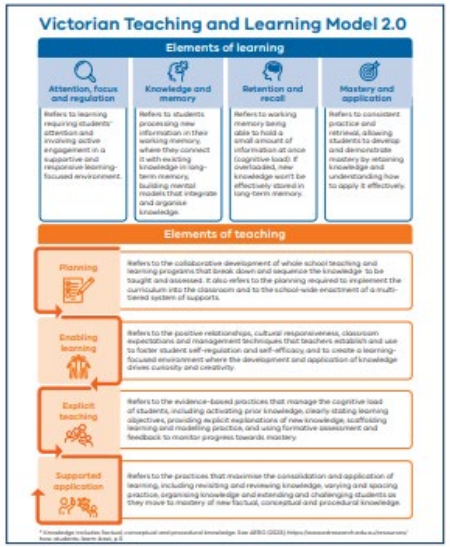
The revised VTLM is not an end in itself. Effective teaching is not an end in itself. Both are means to an end that sees as many students as possible developing the proficiency in mathematics that will both provide them with the pragmatic capacity to manage the numeracy requirements for participation as a full citizen in our contemporary and future communities, and provide access to the joy and wonder of mathematics.

It took a Year 3-4 class in an inner-city school to remind me of the conceptual purity of mathematics. Recently, I worked for a day as a relief teacher at one of our most disadvantaged primary schools. The daily outline left included a video link that explained two and three dimensions. The class and I watched in increasing bafflement.

I couldn't follow the explanation and neither could any of the students. So I switched it off, brought all the students to the front of the room, sat down on one of the small chairs, and had a go at explaining two dimensions and three dimensions.

In a moment, I was taken back many years earlier to when I had been a student in a Year 7 maths lesson and we had to memorise some definitions. While it was generally a dreary task, I vividly recalled turning over and over in my mind the abstract perfection of the sentence: *A point marks a position but has no magnitude.*

It was a reminder that mathematics is beautiful in its conceptual purity and that giving all students access to that beauty is one of the great responsibilities – and delights – of school education.



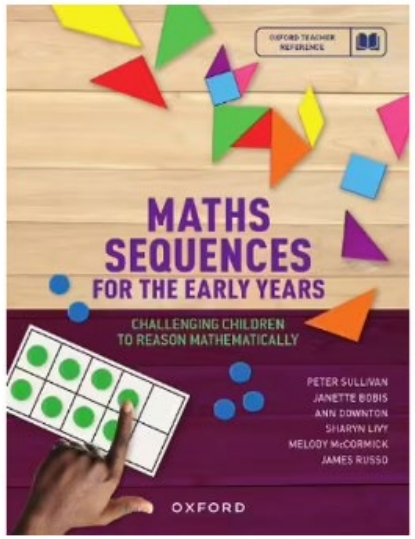
The introduction of the revised VTLM alone is not going to immediately and miraculously lift numeracy attainment levels nor engender a sudden love of numbers in every student.

There are other deep and complex issues to address including a widespread culture of acceptance of being 'no good at maths' throughout our community, associated 'maths anxiety' that is such a barrier to learning, and long-standing teacher shortages in the areas of mathematics and science. But it does give us an excellent framework to ensure that the outstanding teaching practices in many of our schools become the teaching practices used in all our schools.

As part of MAV's vision to develop confident, capable and engaged lifelong learners of mathematics, we aim to support all Victorian teachers to be what your students need you to be: the best possible teacher of mathematics. We will continue to offer a range of high-quality resources and professional learning opportunities, including on-demand professional development modules, regional conferences, online community discussions, and targeted in-school consulting. If your school is interested in targeted professional learning or consulting to support curriculum planning with one of our mathematics education experts to effectively implement the VTLM 2.0, please contact consulting@mav.vic.edu.au

https://www.mav.vic.edu.au/Tenant/C0000019/Common%20Denominator%20Term%204%202024%2020241009_high%20res.pdf

Helpful Resources



https://www.resolve.edu.au/

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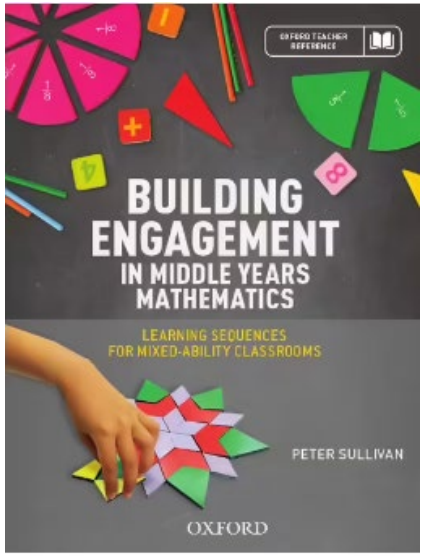
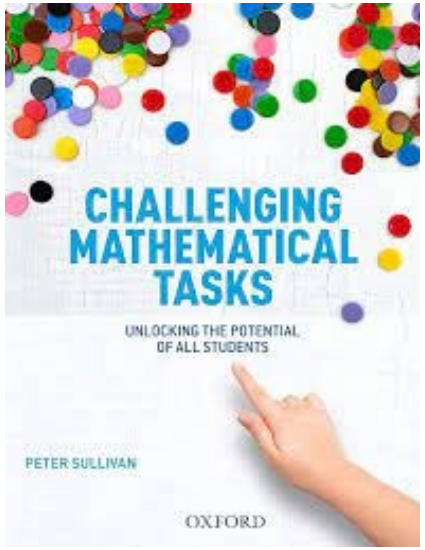
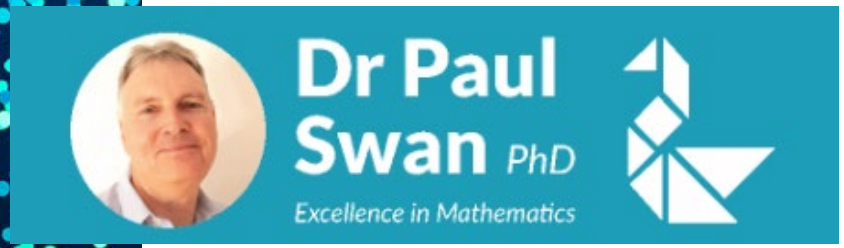




https://www.lovemaths.me/



https://drpaulswan.com.au/

Love Maths

http://www.surfmaths.com/

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Event App

App Download Instructions

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Step 2: Enter Event Code: **mav**

Step 3: Enter the email you registered with

Step 4: Enter the Passcode you receive via email and click 'Verify'. Please be sure to check your Junk Mail for the email, or see the Registration Desk if you require further assistance.

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Be in it to WIN!