

CURRICULUM, PEDAGOGY AND BEYOND



THE MATHEMATICAL
ASSOCIATION OF VICTORIA

MAV24
CONFERENCE

LEADING CHANGE IN MATHEMATICS



Acknowledgement of Country

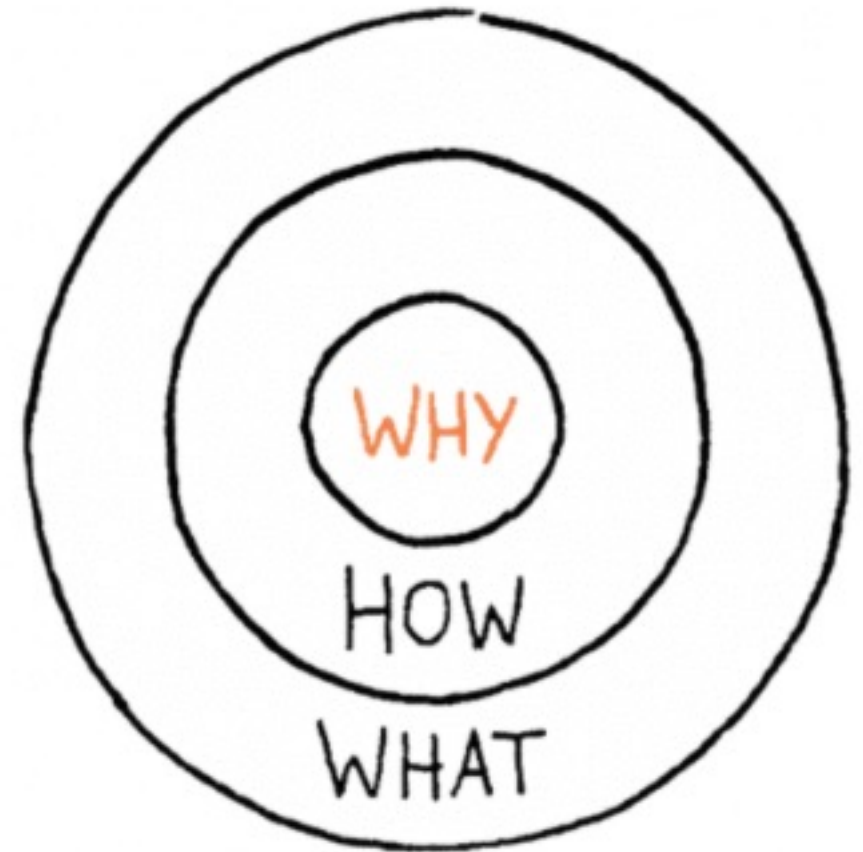
Objectives

Central Idea

Transforming Mathematics teaching and learning through values, coaching, and professional development fosters a supportive and effective educational environment.

Lines of Inquiry

- 1. Exploration of Core Values:** How do core values influence and guide the transformation of teaching practices in Mathematics?
- 2. Role of Coaching and Mentoring:** In what ways can coaching and mentoring support teachers in adopting and sustaining new teaching strategies?
- 3. Impact of Professional Learning and Personal Inquiries:** How do ongoing professional learning and personal inquiries contribute to continuous improvement in Mathematics education?





Disclaimer

Victorian Teaching Academy Numeracy Suite:

- Leading Mathematics Planning
- Student-Centred Assessment in Mathematics
- Leading Improvement in Mathematics Teaching

MAV Consultant - Di Liddell Books

- Peter Sullivan Leading Improvement in Mathematics Teaching and Learning
- Anything by Di Siemon

Milgate Primary School

- IB PYP school
- 800 students
- Approximately 60 teaching staff and 24 ES staff
- Out of the classroom 1 day, transitioning to full time out as Leading Teacher and then AP.
- Coaching and mentoring teachers
- 3-4 PL a term with whole staff
- Modelling lessons, observing lessons
- Attending planning
- Running Learning Leader's PL
- Since 2021



Key learning

- Not everyone has the same values
- You need to have the big picture in mind – the how you get there can be flexible and **will** change
- Understand what is a problem for all and a problem for some
- People's understanding comes with time – not all are ready for the information.
- Everyone will be at different places, how you manage that is important
- You have to be approachable
- Compliance is not the goal.



Our guiding principles

Our approach to Mathematics teaching and learning at Milgate Primary School is grounded in four fundamental principles:

Principle 1:	Students need to think in order to learn.
Principle 2:	Positive mathematical identities are formed when each student has an equitable access to mathematics.
Principle 3:	Units are informed by data, curriculum, and professional learning.
Principle 4:	Our role is to provide multiple experiences for students to construct conceptual understandings.



The 'What'

THEN

- Three-star tasks
- Reciprocal Teaching on Friday
- Curriculum covered of content descriptors
- Isolated strands
- Mathematics anxiety & over compensation
- Separate to IB approach
- No stretch, no support, not 'point of need'
- Streaming without boundaries
- I do, we do, you do.



The 'What'

NOW

- Conceptual links
- Units of work (conceptual, transdisciplinary or big ideas)
- Launch, Explore, Summarise
- Student-centred inquiry
- Building teachers' pedagogical and content knowledge
- Clear planning approach



The 'How' – Creating Units



The 'How'

PYP Learning Continuum | Victorian Curriculum

In order for my students to partition numbers using place value, they need to understand that numbers can be constructed in multiple ways.

In order for my students to construct displays appropriate for data type, they need to understand that different graph forms highlight different aspects of data more efficiently.



The ‘How’

Specified & Additional Concepts in Mathematics

VC Content Descriptor: Count collections to 100 by partitioning numbers using place value (VCMNA088)

Key Concept: Form

The base 10 place value system is used to represent numbers and number relationships.

Key Concept: Function

Numbers can be partitioned in a variety of ways to enable efficient counting.

Key Concept: Connection

The operations of addition and multiplication are related to each other and are used to process information to solve problems.

The 'How'

- Skills mapped conceptually to create units.

Victorian Curriculum Strand: Number & Algebra		PYP Learning Continuum: Number / Pattern & Function	
Achievement Standard	Content Descriptors	PYP Conceptual Understandings	Key / Related Concepts
In order for students to...		Students will understand ...	
Students solve simple problems involving the four operations using a range of strategies including digital technology.	<p>Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies (VCMNA183)</p> <p>Solve problems involving division by a one digit number, including those that result in a remainder (VCMNA184)</p> <p>Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (VCMNA185)</p>	<p>Function: That mathematical problems can be solved in a variety of ways. (process, place value: remainders/decimals)</p> <p>Perspective: That the most efficient strategy to solve problems are unique to individuals. (flexibility, exploration)</p>	<p>Key Concept/s: Perspective (Why is this strategy best for me?)</p> <p>Function (What happens when I have a remainder?)</p> <p>Related Concepts: Flexibility Representation Balance Exploration Process Method Relationships Speed Number Place Value</p>

Types of units

Trust the Count
Students explore the concept of form by recognising small collections without counting and modelling small collections in a variety of ways. Over time, they will connect number names to numerals and explore the concept of function by exploring the use of numbers in the real world.
(Trust the Count)
<ul style="list-style-type: none">→ Numbers can be constructed and represented in a variety of ways (form, representation)→ Numbers are a naming system (function)→ There is an order to counting (function)
Key Concepts: form, function Related Concepts: representation

Relationships
Through the conceptual lens of relationships students will investigate fractions, division and multiplication together, fractions, time and angles together and addition and subtraction together. They will start to articulate and explain the connections they identify.

How We Express Ourselves
Students will explore the function of data displays and the different ways we organise information.
<ul style="list-style-type: none">→ scale can represent different quantities in graphs→ that probability is based on experimental events in daily life→ data can be collected, organised, displayed and analysed in various ways
Key Concepts: Function Related Concepts: Information & Organisation

The 'How'

- Skills mapped conceptually to create units.

Victorian Curriculum Strand: Number & Algebra		PYP Learning Continuum: Number / Pattern & Function			
Achievement Standard	Content Descriptors	PYP Conceptual Understandings	Key / Related Concepts	Frequency	
In order for students to...		Students will understand ...			
Students solve simple problems involving the four operations using a range of strategies including digital technology.	<p>Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies (VCMNA183)</p> <p>Solve problems involving division by a one digit number, including those that result in a remainder (VCMNA184)</p> <p>Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (VCMNA185)</p>	<p>Function: That mathematical problems can be solved in a variety of ways. (process, place value: remainders/decimals)</p> <p>Perspective: That the most efficient strategy to solve problems are unique to individuals. (flexibility, exploration)]</p>	<p>Key Concept/s: Perspective (Why is this strategy best for me?)</p> <p>Function (What happens when I have a remainder?)</p> <p>Related Concepts: Flexibility Representation Balance Exploration Process Method Relationships Speed Number Place Value</p>	U2	U4
				U5	U8

The 'How'

<p>Foundation</p> <p>Attributes</p> <ul style="list-style-type: none">→ Subitise small collections of objects (VCMNA071) (trust the count) <p>Causation</p> <ul style="list-style-type: none">→ Compare, <u>order</u> and make correspondences between collections, initially to 20, and explain reasoning (VCMNA072) (trust the count)→ Represent practical situations to model addition and subtraction (VCMNA073) (trust the count) <p>Pattern</p> <ul style="list-style-type: none">→ Sort and classify familiar objects and explain the basis for these classifications, and copy, continue and create patterns with objects and drawings (VCMNA076) (algebraic thinking)	<p>Year 1</p> <p>Sequence</p> <ul style="list-style-type: none">→ Count collections to 100 by partitioning numbers using place value (VCMNA088) (trust the count and place value)→ Represent and solve simple addition and subtraction problems using a range of strategies including counting on, partitioning and rearranging parts (VCMNA089) (trust the count and place value) <p>Causation</p> <ul style="list-style-type: none">→ Recognise, <u>describe</u> and order Australian coins according to their value (VCMNA092) <p>Pattern</p> <ul style="list-style-type: none">→ Investigate and describe number patterns formed by skip counting and patterns with objects (VCMNA093) (algebraic thinking)	<p>Year 2</p> <p>Sequence</p> <ul style="list-style-type: none">→ Investigate number sequences, initially those increasing and decreasing by twos, threes, <u>fives</u> and ten from any starting point, then moving to other sequences (VCMNA103) (trust the count & place value)→ Group, partition and rearrange collections up to 1000 in hundreds, <u>tens</u> and ones to facilitate more efficient counting (VCMNA105) (place value) <p>Causation</p> <ul style="list-style-type: none">→ Explore the connection between addition and subtraction (VCMNA106) (trust the count and algebraic thinking)→ Solve simple addition and subtraction problems using a range of efficient mental and written strategies (VCMNA107) (trust the count) <p>Pattern</p> <ul style="list-style-type: none">→ Describe patterns with numbers and identify missing elements (VCMNA112) (algebraic thinking)→ Solve problems by using number sentences for addition or subtraction (VCMNA113) (algebraic thinking)→ Apply repetition in arithmetic operations, including multiplication as repeated addition and division as repeated subtraction (VCMNA114) (algebraic thinking)
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Planning - unit

CURRICULUM	LEARN	ASSESS	DATA	GOALS	SEQUENCE
CONTENT	STUDENTS		UNIT		
Analyse and understand the mathematics	Analyse and understand the students		Form a data-informed unit trajectory		
<p>Using curriculum and educational texts to identify the key mathematical concepts, progression of learning, skills, and vocabulary.</p> <p><i>Ask yourself:</i> <i>Do I understand the mathematics involved?</i> <i>What is the progression of learning?</i> <i>How are students moving through the 'big <u>ideas</u>'?</i> <i>What are the important verbs in the curriculum?</i></p>	<p>Conducting assessment that has been designed or carefully chosen by teachers to ascertain students' knowledge, <u>skills</u> and affective learning. Conduct a data protocol with the team to unpack and identify depth and breadth of knowledge across the classes.</p> <p><i>Ask yourself:</i> <i>What do the students currently know?</i> <i>How do the students currently approach problem solving in this context?</i> <i>What are the students' current dispositions towards mathematics?</i> <i>Where do the students sit along the continuum of this concept?</i></p>		<p>Establish a clear mathematical trajectory for the unit and select and sequence tasks. Plan formative assessment methods, such as development of rubrics and/or checklists and plan for informal moderation with the team throughout the unit to monitor the students' learning outcomes.</p> <p><i>Ask yourself:</i> <i>What do the students need to understand by the end of the unit?</i> <i>How will we provide frequent opportunities for students to transfer their knowledge?</i> <i>Where are the opportunities for students to progress through the inquiry cycle?</i></p>		



The 'How' – Learning Experiences

Student-centred inquiry learning experiences: Students learning through thinking and doing.

OPEN-ENDED TASKS

CHALLENGING TASKS

MATHEMATICAL GAMES

RICH TASKS

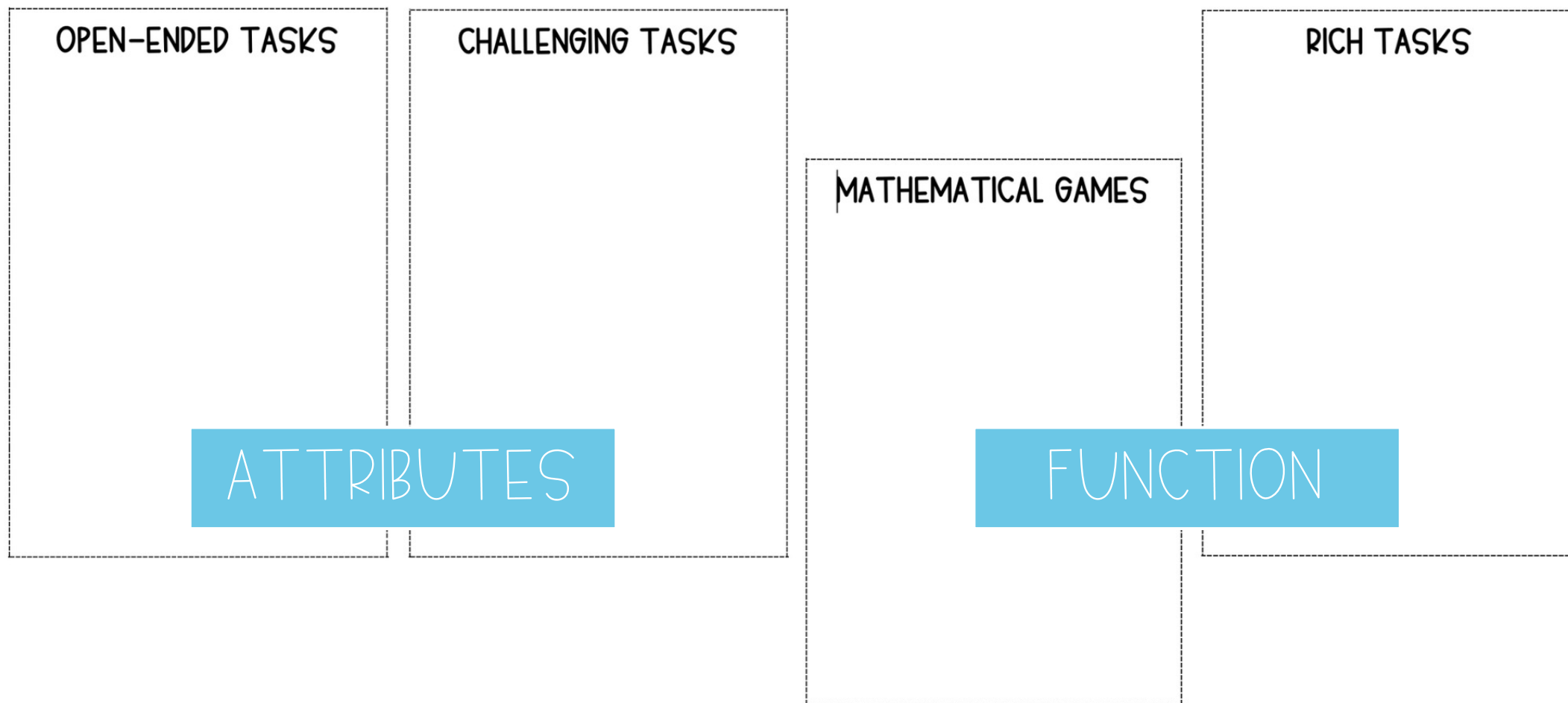
Language

better central idea

Different approaches to teaching Mathematics are interrelated, however there are nuances in their attributes that allow for definitions to be formed.



Forms of student-centred inquiry experiences



Forms of student-centred inquiry experiences

Which task?

- Rich?
- Open-ended?
- Challenging?

Make your own timetable to show a new student what happens in a typical school week.

Redesign this classroom using the same furniture as we have already. Present your design on a map or plan drawn to scale.

An easy way to add 9 is to add 10 and take away 1. Using a similar strategy what other numbers might I add or subtract in this way?

One of your friends, Fred, asked you to help him with his addition calculations. He has done some questions like this:

$$1.1 + 0.2 = 1.3$$

$$2.3 + 4 = 2.7$$

$$6 + 3.7 = 9.7$$

$$6.9 + 2 = 7.1$$

What are some other questions that Fred might get wrong? What advice would you give Fred to help him?

Forms of student-centred inquiry experiences

- Jigsaw Activity
- Professional readings
- Key attributes
- Redefined and resorted the activities

design alone, does not guarantee that all students will achieve their learning potential [8,9]. Classroom norms that respect differences among learners and encourage individual autonomy are integral to classrooms where differentiated instruction is practised and are reflective of student-centered teaching approaches [1,3,7]. Maintaining an optimal balance between autonomy and teacher support as students with diverse needs work on the same task is acknowledged as an aspect of quality teaching [10,11], but also as one of the most difficult aspects of teaching to implement in the classroom [3]. Studies of teaching approaches for differentiating mathematics instruction have focused on teachers of middle school [1] and high school [3], but we could not find any that have explicitly examined the instructional beliefs or practices of teachers working with students in the first three years of school. Just as rare is research reporting the practices of early years teachers who differentiate mathematics instruction through a focus on challenging tasks despite current curriculum documents, educational systems, and reports of international comparative studies espousing the benefits of such approaches [5,12,13].

The current study was designed to address this gap in the research literature. Our aim was to develop a better understanding of the beliefs and reported practices of primary teachers teaching students in the first three years of school (Foundation to Grade 2). These teachers participated in professional learning focused on challenging tasks differentiated through their open-ended design and the use of enabling and extending prompts. The findings may assist other teachers to embrace challenging tasks and will have implications for instructional strategies that teachers implement to support the needs of diverse learners in their classrooms.

In the context of differentiated mathematics instruction, student-centered approaches emphasizing challenge have social, psychological, and didactical implications [7,14]. In the next sections, we discuss literature highlighting the importance of challenge and struggle for student learning of mathematics and present our perspective on tasks that have the potential to achieve an optimal level of challenge and engagement for students with diverse needs. Integral to this discussion are teachers' beliefs about how students learn mathematics and the nature of instruction that is reflective of such beliefs. Following this, we introduce our instructional approach and the research project in which this study was situated.

2. Literature Review

2.1. Challenge, Struggle, and the Design of Mathematical Tasks

In the past few decades, the construct of challenge has become an essential element of mathematics instructional approaches that promote conceptual understanding, learner autonomy and mathematical reasoning [7,15]. Despite growing emphasis on challenge as a focus of mathematics instruction in research literature and curriculum documents [16,17], concerns have been raised by practitioners and policymakers about whether such approaches benefit students with specialized academic needs, with some perceiving that challenging mathematics is solely for gifted students [7,18]. However, there is a growing body of research utilizing large sets of student achievement data that now confirms conceptually demanding instructional approaches can meet the needs of diverse students [18,19]. In a study designed to examine whether exposure to a range of learning practices emphasizing conceptually based and cognitively demanding tasks would be effective for a diverse group of upper primary students (ages 10–12) in the United States, Blazar and Archer [18] found that “when implemented in classrooms . . . the use of conceptually based teaching shows benefits for all students” (p. 306). Mathematical tasks and lessons that require students to use reasoning and make connections among concepts, procedures, and representations are considered necessary for conceptual understanding. There is also evidence indicating that “students are more likely to make sense of mathematics when they indicate what they have learned if they work on tasks that are appropriate

WHAT MAKES A RICH TASK?

Pete Griffin responds to an editorial request to document an INSET he provided on rich tasks.

“To do the right thing is not enough; to be competent one must also know what one is doing and why it is right”. Von Glasersfeld, 1987.

This quote is about student learning and is often used (well, at least, I have often used it) to convey one of what I consider to be the main principles of assessment for learning – i.e. that learners need to be aware of their own learning.

A common view seems to be emerging in the mathematics education world at the moment that the development and use of ‘rich tasks’ is a good thing, a ‘right thing’ to do. We have many examples of these ‘rich tasks’ and, as teachers, we are encouraged to use them whenever we can.

As learners, professional learners ourselves it is right that we don’t just accept this uncritically, but question what a rich task is and why we should value them. This article is my own reflection on the nature and value of rich tasks and draws on a session which I was asked to run for Somerset heads of department last year.

So what exactly makes a rich task? What are we referring to when we use this phrase? Wherein lies the richness?

Let’s start with a couple of conjectures:

- A
- d
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- T
- Learni
- this is

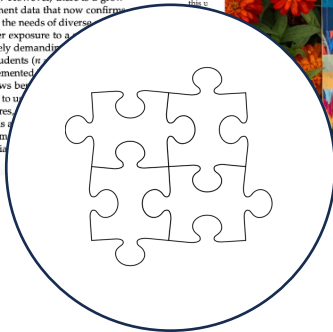
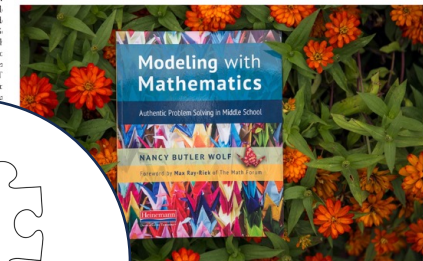
- Build on the knowledge learners bring to lessons.
- Expose and discuss common misconceptions.
- Develop effective questioning.
- Use cooperative small group work.
- Emphasise methods rather than answers.
- Use rich collaborative tasks.
- Create connections between mathematical topics.
- Use technology in appropriate ways.

So, there is a suggestion here that it is the combination of the task and the following of some pedagogic principles that makes for richness. I am struck, however, by the rather circular argument that one of these ‘principles’ is the use of ‘rich collaborative tasks’! Maybe it is the collaboration that is really being highlighted here and that provides me with a very helpful question to work on in my own practice – i.e. whether collaboration is always necessary for a rich learning experience.

And then (also in ‘Improving Learning in Mathematics’):

These types are not there to simply provide variety (though they do); they are devised to develop different ways of thinking.

- Clarifying mathematical objects.
- Illustrating multiple representations.



Five principles of educationally rich mathematical games



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Mathematical games are widely used in the primary classroom; however, not all games are equally valuable. How might teachers decide which specific games to introduce? The authors present five principles of educationally-rich games to support teachers to address this issue.

Introduction

As educators, we enjoy playing and teaching mathematical games. We spend many hours lost in conversation attempting to create new, educationally-rich games for our students. Once an idea for a game germinates, we play it ourselves and continually refine it until we feel it is classroom ready. After introducing the game to our students, we tinker with it some more. We modify the rules based on student feedback, and observations. This cycle of invention, feedback, and refinement, maintains our energy and motivation to keep attempting to develop new games for our students. However, are our newly created games truly original? Our ‘new’ mathematical games may be simply built on the principles of prior games.

Despite our creative endeavours, so-called new mathematical games tend to be a derivative of mechanisms and representations that are used within existing activities. Gough (2004) argued it is highly unusual for mathematical games to be truly original, as they tend to cycle through a similar set of processes and ideas. We argue that an understanding of these underlying commonalities can further assist us and other educators with both the creation of new games, as well as the evaluation of existing games. This invites the question: What principles do educationally-rich mathematical games have in common? The purpose of this article is to shed light on this question by presenting five principles of educationally-rich mathematical games that emerged from our experiences as game designers, classroom teachers and a review of relevant literature.

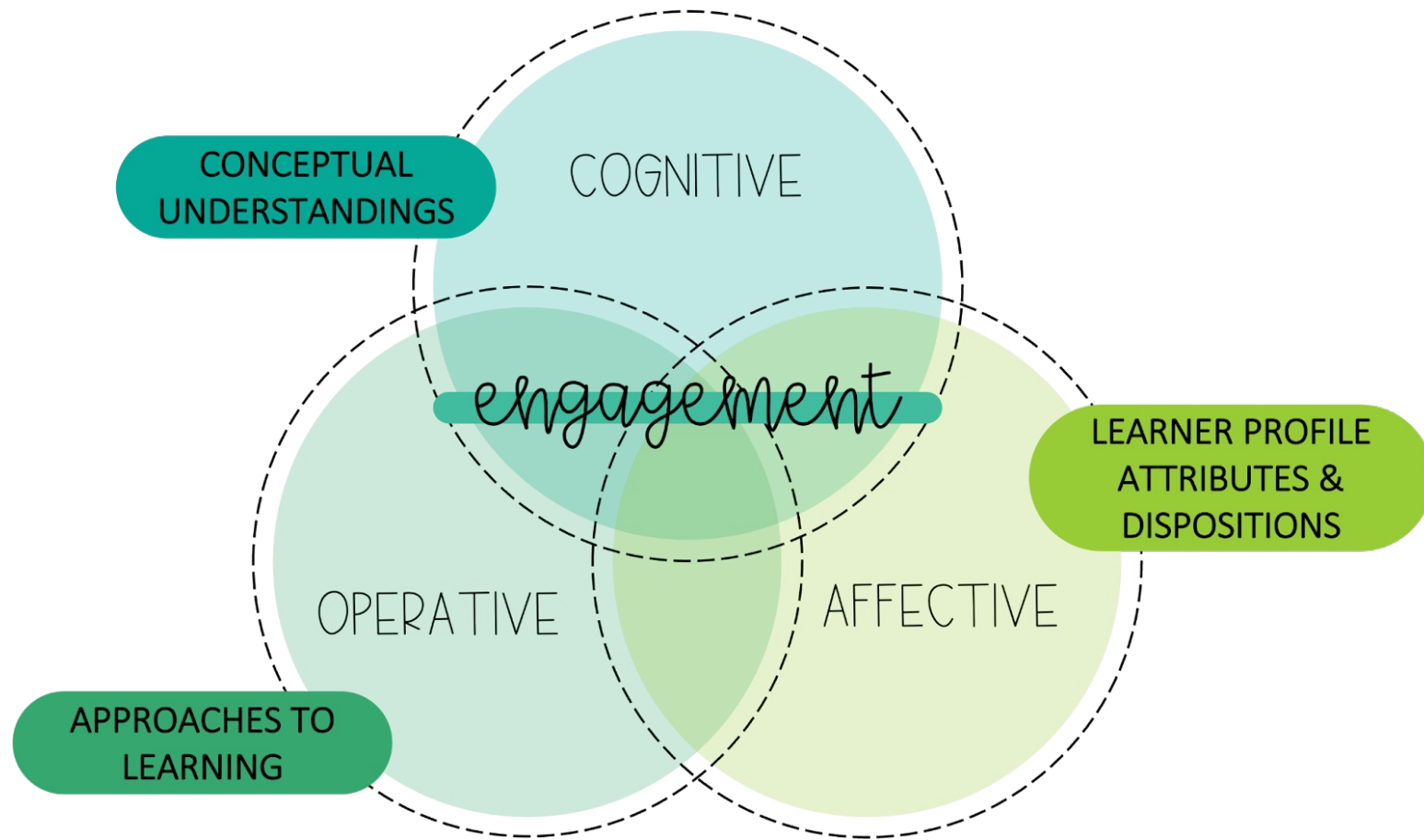
Principle 1: Students are engaged	Mathematical games should be engaging, enjoyable and generate mathematical discussion.
Principle 2: Skill v luck	Mathematical games should appropriately balance skill and luck.
Principle 3: Mathematics is central	Exploring important mathematical concepts and practising important skills should be central to game strategy and gameplay.
Principle 4: Flexibility for learning and teaching	Mathematical games should be easily differentiated to cater for a variety of learners, and modifiable to cater to a variety of concepts.
Principle 5: Home-school connections	Mathematical games should provide opportunities for fostering home-school connections.

Forms of student-centred inquiry experiences

CHALLENGING TASKS	OPEN-ENDED TASKS	RICH TASKS
ACCESS TO ALL LEARNERS Build on what students already know. More than one correct answer and/or more than one solution pathway. Take time to solve. DEPTH – Foster connections between mathematics concepts. Emphasise methods, rather than answers – STUDENT AGENCY Exposes and discusses misconceptions.		

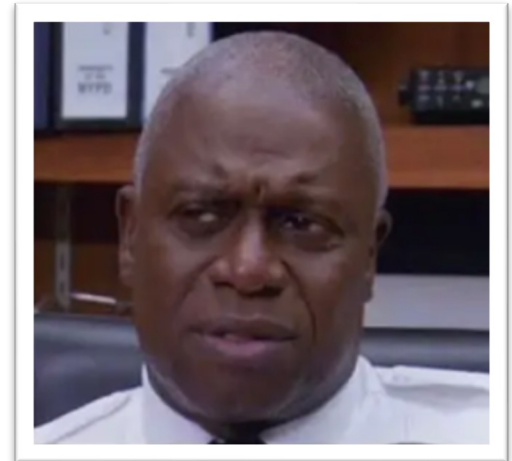
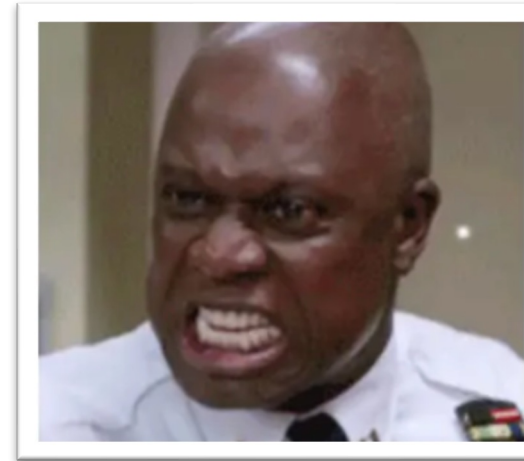
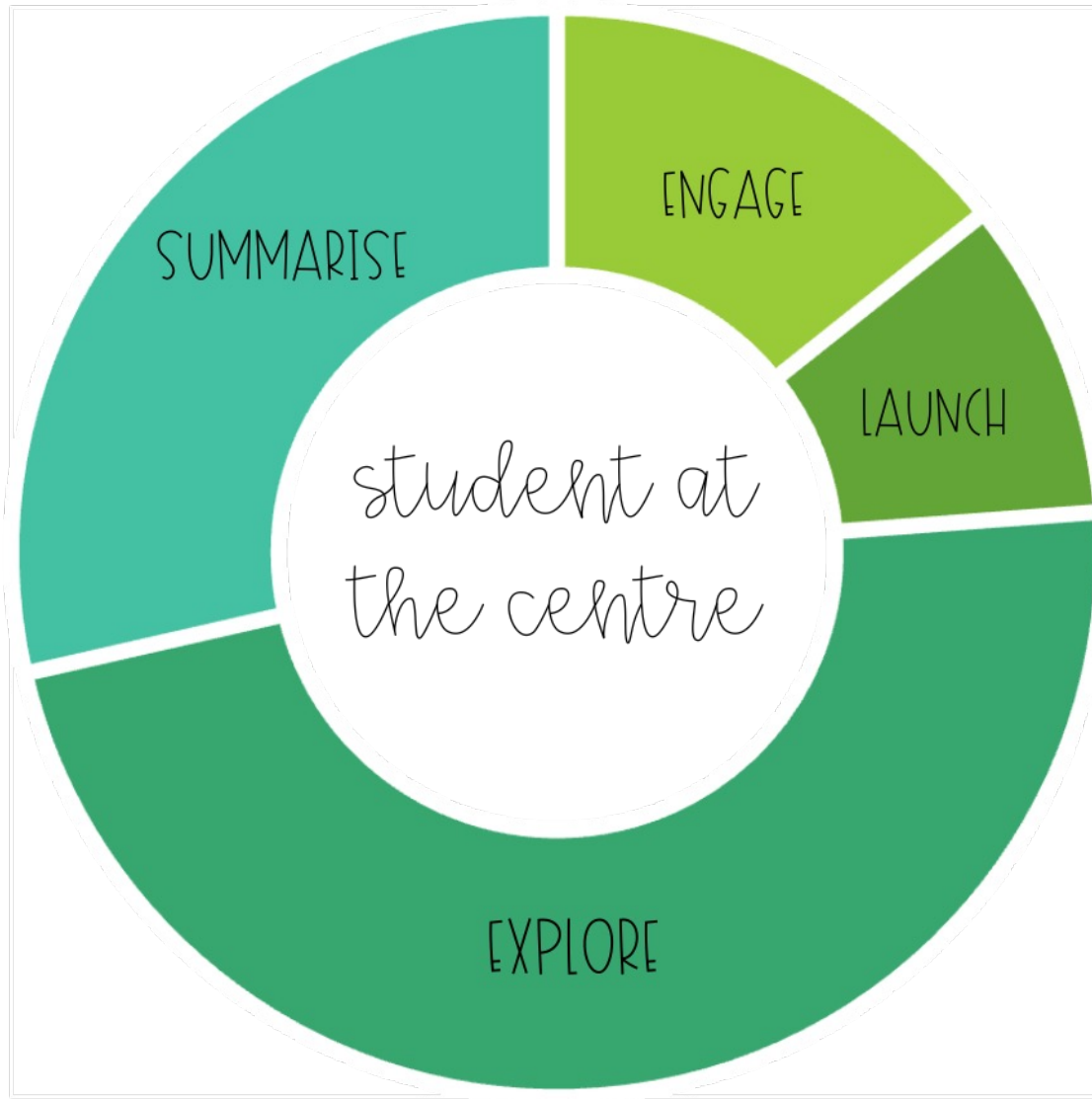
Forms of student-centred inquiry experiences

CHALLENGING TASKS	OPEN-ENDED TASKS	RICH TASKS
<p>ACCESS TO ALL LEARNERS</p> <p>Build on what students already know.</p> <p>More than one correct answer and/or more than one solution pathway.</p> <p>Take time to solve.</p> <p>DEPTH – Foster connections between mathematics concepts.</p> <p>Emphasise methods, rather than answers – STUDENT AGENCY</p> <p>Exposes and discusses misconceptions.</p>		
Productive struggle / zone of confusion (students do not initially know how to solve the problem)		Real-world connections / applications.



Learning About (cognitive)	Learning To (operative)	Learning to Be (affective)
How does the place value system allow us to represent and compare numbers?	Can you use models to explore the place value system?	How can we be self-managers and use strategies to work through challenges?

The 'How' - Lesson Structure

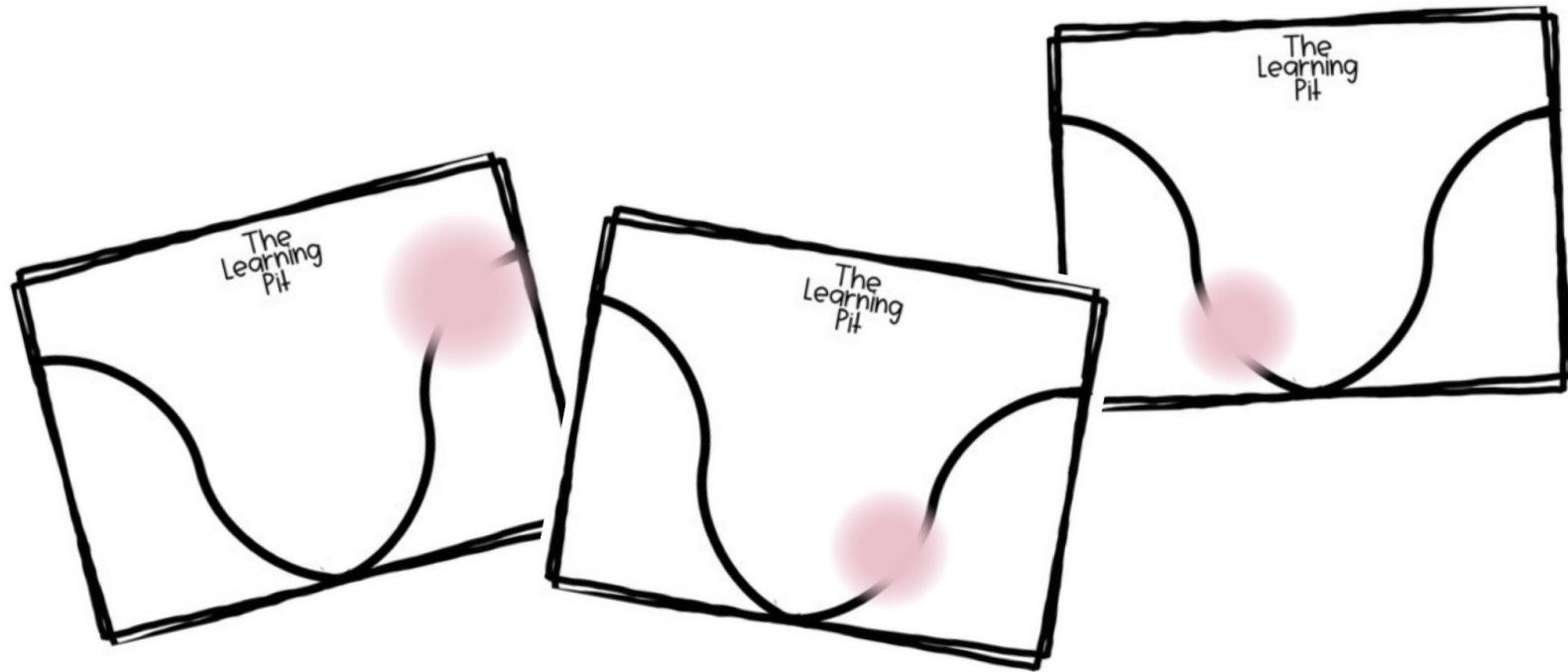


What is learning?

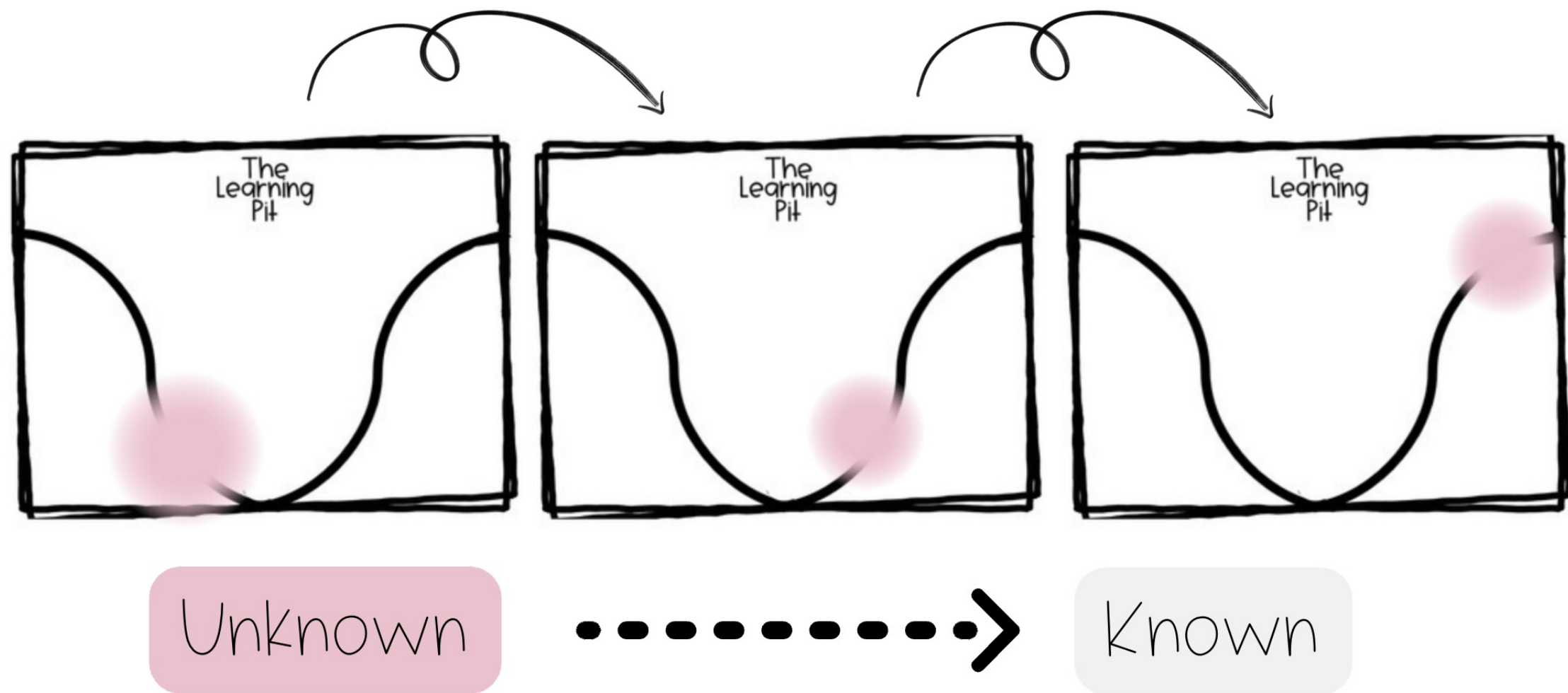
Simple



Complex



What is learning?



Values, Ideals & Criteria

Our values impact, and are communicated through, the learning experiences we create.

Feeling relaxed or having fun
when doing maths.

I value ...

Working hard when doing maths

Remembering maths ideas,
concepts, rules or formulae.

I value ...

Creating maths ideas, concepts
rules or formulae.

THINKING ROUTINE:

TUG OF WAR

Student voice sharing their strategies

what would our ideal math unit/learning experience look, sound, feel like?

A challenging task over a few days. ^{Perseverance}
Well designed enabling & extending prompts
Access to concrete materials
Planning adaptations as we teach the unit.
Responsive
Open-ended
Student centered.
Learning pit
Student voice summary ^{to be} connected to the real world.
Safe to make mistakes

what would our criteria be for a student-centred

what would our ideal math unit/learning experience look, sound, feel like?

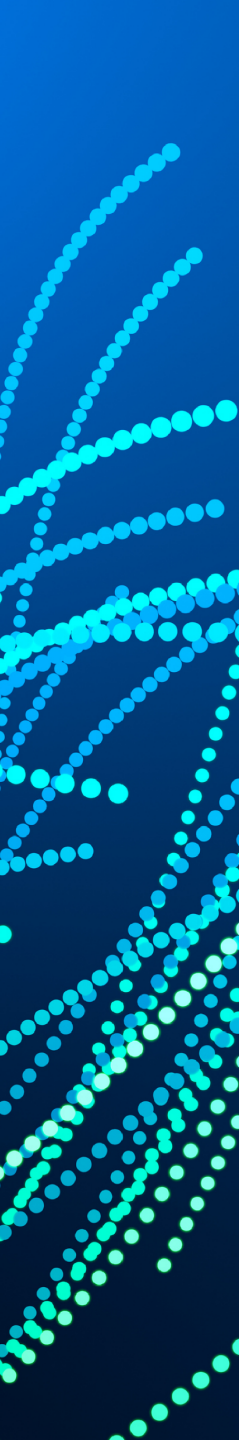
- Holistic
- Challenged
- Differentiated
- Varied
- Multi-faceted
- Manipulatives
- Rich in resources
- Collaboration
- Group & individual focus

students active
teachers are
teaming or with
focus group

- challenged + successful
- Math language
 - Small focus groups
 - Discovery
 - Reflection
 - Purposeful
 - Student voice
 - Questions
 - Connection to experience & real world

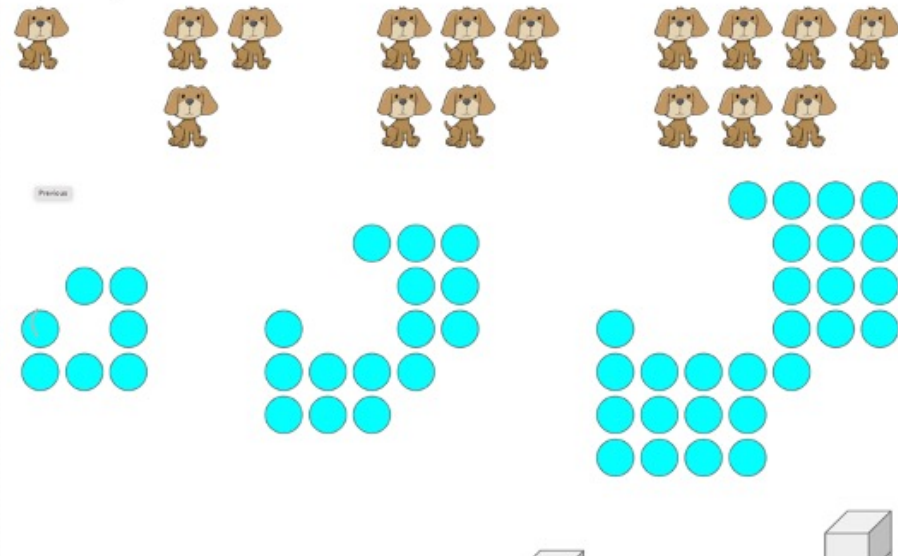
what would our ideal math unit/learning experience look, sound, feel like?

what would our criteria be for a student-centred learning experience?



Scenario: To support students in uncovering patterns and developing equations, use the See-Think-Wonder routine with the following patterns. First, show students a pattern and ask, "What do you see?" In response, students describe patterns and talk about how they would count the objects. Then, move on to asking, "What do you think?" Instruct students to think about what the next step in the pattern would be. This will lead to the question, "What do you wonder?" Students might wonder about what the 100th step would look like and how they could find out. This discussion will lead students to a conceptual understanding of equations.

Prompt: What would step 43 be? (Or if you give them the 43rd step, What is the equation?)



thinking routine: does it fit?

Fit your options to the **Ideal**

Reflect on what our Ideal Mathematics teaching and learning would look like and then evaluate each learning experience against it. Ask yourself: How well does each experience fit with the ideal situation? Do you need to adapt anything to make it fit?

Fit your options to the **Criteria**

Reflect on our criteria or attributes that we feel are important to consider and then evaluate each experience against those. Ask yourself: How well does each experience fit the criteria? Do you need to adapt anything to make it fit?

Fit your options to the **Situation**

Identify the realities and constraints of your situation, such as resources and time, and then evaluate each experience against them. Ask yourself: How well does each option fit the realities of the situation? Do you need to adapt anything to make it fit?

Does it fit our
ideals?

Does it fit our
criteria?

Does it fit your
situation?

Does it fit your
values?

within my own personal values? Do you need to adapt anything to make it fit?

Lesson Structure

What to teach, and what to leave unknown ...

- Each student-centred inquiry experience has a breakdown of what it looks like in relation to the lesson structure.

Mathematical Games



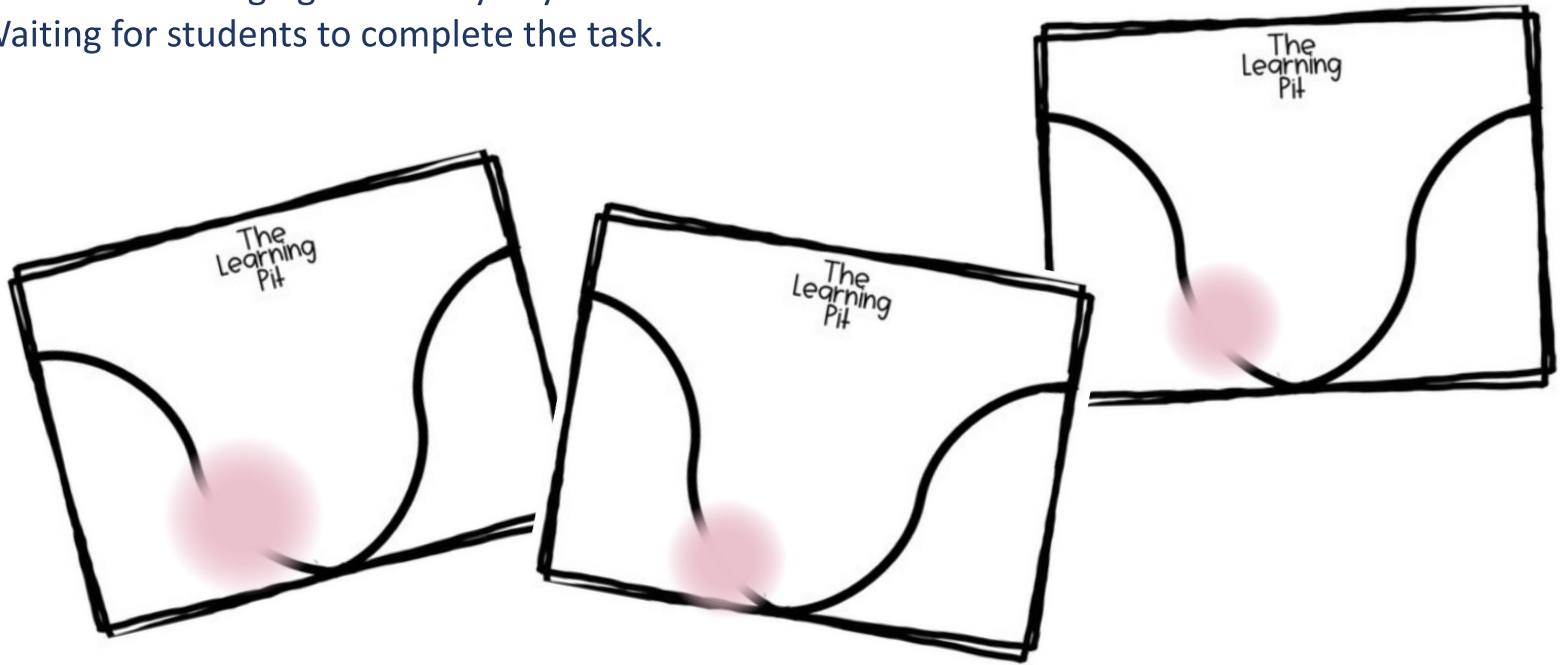
Lesson Step	Questions to Ask Yourself	Might Look Like
Launch	<i>Are students playing the game for skill practice or to identify strategies to improve the chances of winning? Is this clear to the students?</i>	<p>The teacher making the learning intentions clear to the students (skill or strategy?). They model how to play the game so that there is no confusion. They explain each player's role in the game.</p> <p>The student is observing the game being modelled and asking clarifying questions if needed.</p>
Explore	<i>Are students explaining their thinking as they play OR showing their working out?</i> <i>Is anyone demonstrating something that could be explored in the summarise?</i> <i>Are the players monitoring each other and making sure the other is correct in their calculations?</i>	<p>The teacher playing with students' to target teaching at point of need or roving to provoke thinking of students and ensure</p> <p>The students playing and justifying the choices they are making based on skill or probability.</p>
Summarise	<i>What is it that you want to highlight? Skill? Strategies for winning? Strategies of solving a problem?</i>	<p>The teacher is scaffolding the chosen work samples to demonstrate. They are asking questions, paraphrasing the students' explanation and explicitly teaching a skill that needs to be developed.</p> <p>The students are listening and learning from the students showcasing their progress. They could be asking clarifying questions and identifying strategies they may like to explore further in the next session.</p>
Supplementary Tasks	<i>Do the students need to play the game a couple of times to achieve the learning intentions?</i> <i>Is there an opportunity for students to analyse the probability of the game?</i>	

Launch, Explore, Summarise in a week

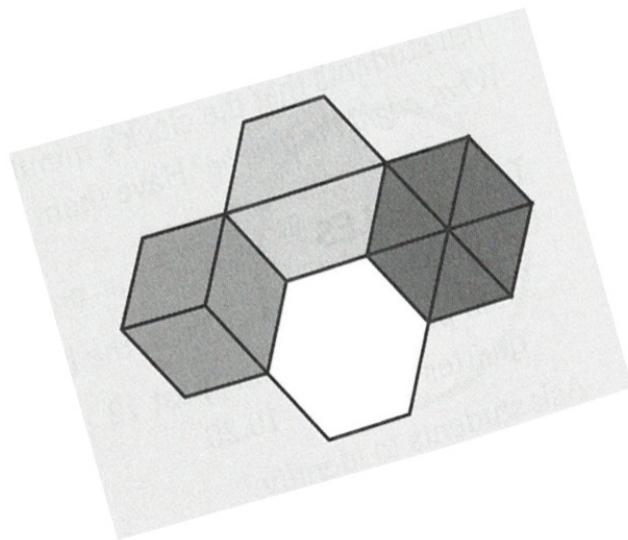
The perpetual struggle

Different challenging task every day

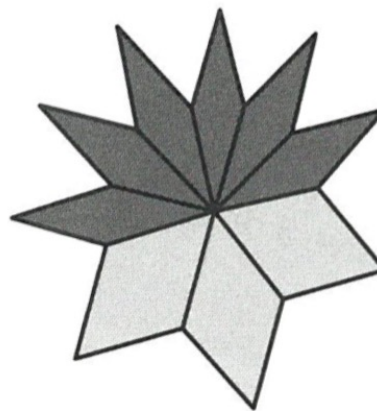
Waiting for students to complete the task.



Supplementary tasks



Unknown

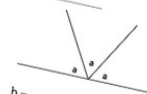


WHAT'S THE ANGLE?

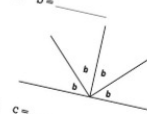
BLM 18

In these diagrams, the angles with the same letter are the same size.
Work out the size of the unknown angles. Then use a protractor to draw the diagrams yourself.

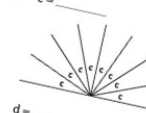
1 $a =$ _____



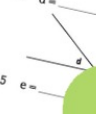
2 $b =$ _____



3 $c =$ _____



4 $d =$ _____



5 $e =$ _____



Known

STUDENT AGENCY

SELF-EFFICACY

SELF-REGULATION

METACOGNITION

Planning - learning experience

ANTICIPATE PHASE

- What are the learning opportunities in this task?
- What do we want to reveal to the students? Scaffold & sequence.
- What are the barriers? If you don't need them to draw a table, give them the table.

TRIAL
THE
TASK



Coaching & Mentoring

- Lot's of surveys
- Signing up vs. being selected.
- Pre observation meetings
- Post observation feedback
- Personal inquiries
 - Teacher's not understanding something
 - Teachers noticing a problem in the approach and wanting to solve it
 - Doing it in a cycle – what is the problem, what could the solution be, test and measure.
- Attending planning sessions and noticing misconceptions in the dialogue.
- Open and honest communication – both ways.



Let's review ...

The what

Units

Learning Experiences

Lesson Structure

Planning

The how

Professional Learning

Learning Experiences

Lesson Structure

Planning

Surveys

Thinking Routines

Lots of discussions and cocreating of ideals and principles.



Key learning

- Not everyone has the same values
- You need to have the big picture in mind – the how you get there can be flexible and **will** change
- Understand what is a problem for all and a problem for some
- People's understanding comes with time – not all are ready for the information.
- Everyone will be at different places, how you manage that is important
- You have to be approachable
- Compliance is not the goal.



Questions

Event App



App Download Instructions

Step 1: Download the App 'Arinex One' from the App Store or Google Play



App Store



Google Play

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.

Be in it to WIN!



A02 - (Year 1 to Year 6) Supporting High Potential and Gifted Learners in Mathematics

Pedagogy

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Speaker



Dr Chrissy Monteleone
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