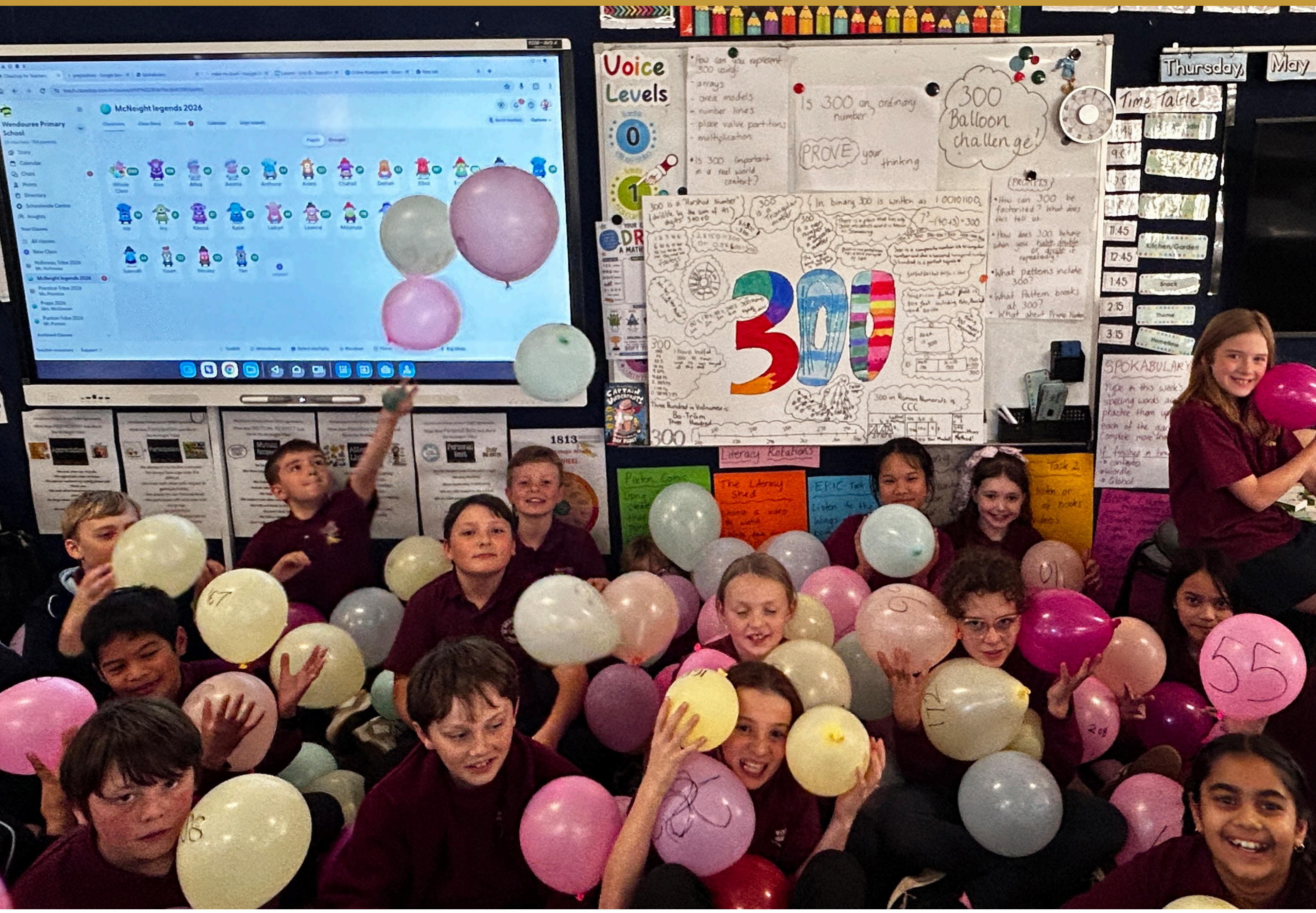
THE MATHEMATICAL ASSOCIATION OF VICTORIA

THE COMMON DENOMINATOR 3/26

300th edition

MATHS ACTIVE TEACHERS



INSIDE

Renee Ladner, MAV and Donna McNeight, Wendouree Primary School

PROFESSIONALLY ACCREDITING MATHS ACTIVE TEACHERS

The MAV Maths Active Teacher accreditation celebrates educators who bring mathematics to life in meaningful, engaging and practical ways. It recognises teachers who move beyond routines and worksheets to create rich opportunities for students to explore, reason, and apply mathematics confidently in real-world contexts. Accredited teachers demonstrate a strong commitment to student thinking, using evidence-informed practices that build understanding, curiosity and connection. Maths Active Teacher recognition highlights educators who are not only effective in their classrooms, but who also contribute to the broader mathematics education community. This accreditation sits alongside MAV's Maths Active Schools accreditation but recognises individuals who are shining in their mathematical field.

Continued on page 5

THE COMMON DENOMINATOR
The MAV's magazine published for its members.

Magazine 300, July 2026

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FROM THE CEO

Jennifer Bowden

It is my pleasure to write this edition's welcome in place of the MAV President during a 'changing of the guard', and to reflect on our recent Annual General Meeting.

This year's AGM, held at the Koorie Heritage Trust, was a wonderful opportunity to come together with MAV members and friends. It was a fitting setting in which to reflect on the strength of our community, recognise important contributions, and look ahead to the future of MAV. One of the great privileges of the role of CEO is the opportunity to meet and talk with members, and these moments of connection are always a reminder of the passion, commitment and professionalism of Victorian mathematics educators.

We delighted to welcome three new board directors. Dr Rachel Pollitt brings deep expertise in early childhood education, James Mott offers extensive experience in senior secondary mathematics education and high-ability learners, and Louise Gray contributes strong expertise in marketing and strategic direction. We look forward to the insight and leadership they will bring to the board.

We also acknowledged and thanked two outstanding Board members for their service. Justin DeLacy has resigned after four years of valued contribution, and Ann Downton has completed her six-year board term. We are pleased that Ann will continue her important involvement with MAV as Annual Conference Convenor.

I would like to thank all MAV's board members, who volunteer their time and expertise to provide governance, strategic and financial direction. Their commitment ensures MAV remains strong, responsive and focused on serving our members.

Kerryn Sandford, completed her term as MAV President in June. John Maxwell's words, 'Change is inevitable. Growth is optional,' ring true in Kerryn's leadership. Kerryn has led MAV with strength and grace through a period of significant change, including the appointment of a new CEO, the development of a new strategic plan, and shifts across the education landscape. She has consistently placed MAV members at the centre of Board decision-making, and I have deeply appreciated her support, wisdom and mentorship. I am delighted that Kerryn will continue as a board director.

The AGM also unanimously passed an amendment to the MAV Constitution, removing the requirement for student members to be studying at a Victorian university and expanding eligibility nationally. This important change enables students to access MAV membership benefits regardless of geography, including our highly valued *Prime Number* and *Vinculum* journals.

A Term 2 highlight was welcoming over 400 educators at the Melbourne Mathematics Conference, held in partnership with the University of Melbourne. I look forward to continuing those conversations at MAV's Annual Conference. Registrations are now open, and the full program will be available soon.

MAV has recognised remarkable milestones of two staff, Michael Green, membership officer, for 23 years of service, and Darinka Rob, office manager, for 20 years of service. Their dedication has helped build MAV into the strong association it is today. If you are interested in contributing through a volunteer role, I encourage you to reach out. MAV's strength depends on the generosity and commitment of its volunteers. Finally, happy 300th edition to our magazine, *Common Denominator*!

UPCOMING MAV EVENTS

For more information and to reserve your place at any of the events below, visit www.mav.vic.edu.au.

EVENT	DATE	YEARS	PRESENTERS
Python fundamentals: from pseudocode to code	21/7/26 (Virtual)	7–12	Robin Wang
Intentional picture book use to boost children's maths, vocabulary, and play	23/7/26 (Virtual)	EC	Dr Helen Schiele
Python in practice: from problems to solutions	28/7/26 (Virtual)	7–12	Robin Wang
First Nations navigation and mapping using digital tools	6/8/26 (Virtual)	F–12	Dr Caty Morris
'I'm finished!' now what? Challenging high achievers the right way	19/8/26 (Virtual)	F–6	Adrienne English
MAV annual conference: Activating mathematical hearts, hands and minds	3/12/26 4/12/26	All	Various

JOIN OUR FACEBOOK COMMUNITY

A NEW HOME FOR CONNECTION AND COLLABORATION

Community has always been at the heart of our work at MAV. The online MAV Community now lives on Facebook, making it easier than ever for members to connect, share ideas, ask questions, and learn from one another.

In a busy profession, it can be hard to find time to step back, reflect, and connect with others who understand the realities of the work. That is where a community of practice becomes so valuable. It creates a space where like-minded people can come together to share resources, exchange strategies, seek advice, and support one another through the challenges and opportunities of everyday practice.

Our community of practice is designed to do exactly that. It is a space for educators and professionals who want to contribute to meaningful conversations, learn from the experiences of others, and stay connected to the broader community. Whether you are looking for a fresh idea, a trusted recommendation, or simply a place to hear what others are doing, the community offers a welcoming environment to do so.

While the platform has changed, the purpose remains the same. This is still a space built on shared knowledge, collaboration, and generosity. The move to Facebook gives the community a more accessible and familiar home, making it easier for members to join conversations, respond in real time, and stay engaged with updates and discussion. For many people, this will mean one less login to remember and an easy way to connect with colleagues.

The strength of any community lies in the people who shape it. When members contribute their experiences, ideas, questions, and resources, the whole group benefits. A useful strategy shared by one person may spark a new approach for another. A question asked by one member may open up a conversation that helps many more. Over time, these small exchanges build into something much larger: a network of support, trust, and professional growth. This is what makes a community of practice so powerful. It is not simply a place to receive information; it is a place to participate in it. Members are encouraged to share what they are working on, what they are curious about, and what they have found useful in their own contexts. In doing so, they help create a living, responsive community that reflects the needs and interests of its members.

We also know that professional connection matters. Sharing ideas with others can help reduce isolation, build confidence, and remind us that we are not navigating challenges alone. Whether you are new to the field or have years of experience, there is value in being part of a space where people are willing to learn from one another and grow together.

We invite you to be part of the conversation. Join the community, introduce yourself, share a resource, ask a question, or simply take a look at what others are discussing. However you choose to engage, your presence adds value. We are excited to continue building a community where members can connect, collaborate, and support one another in meaningful ways.

As our MAV Community continues to grow, we also see opportunities to create smaller, topic-based groups in the future. These would allow members to connect more deeply around specific areas of interest, making it easier to share resources, ask questions, and build conversations around the topics that matter most to them.

To join the community of practice, visit Facebook › Search for MAV Community › Join.

What is a sample trial?

Our digital sample trials have been designed to give users a taster of what the full Oxford Owl experience will be like as a teacher. Each sample comes loaded with resources, usually for one full topic for a unit.

You can activate samples by scanning the below QR codes, or explore all available samples on **oup.com.au/primary/samples**

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MATHS ACTIVE TEACHERS

Renee Ladner, MAV and Donna McNeight, Wendouree Primary School

CONT. FROM PAGE 1.

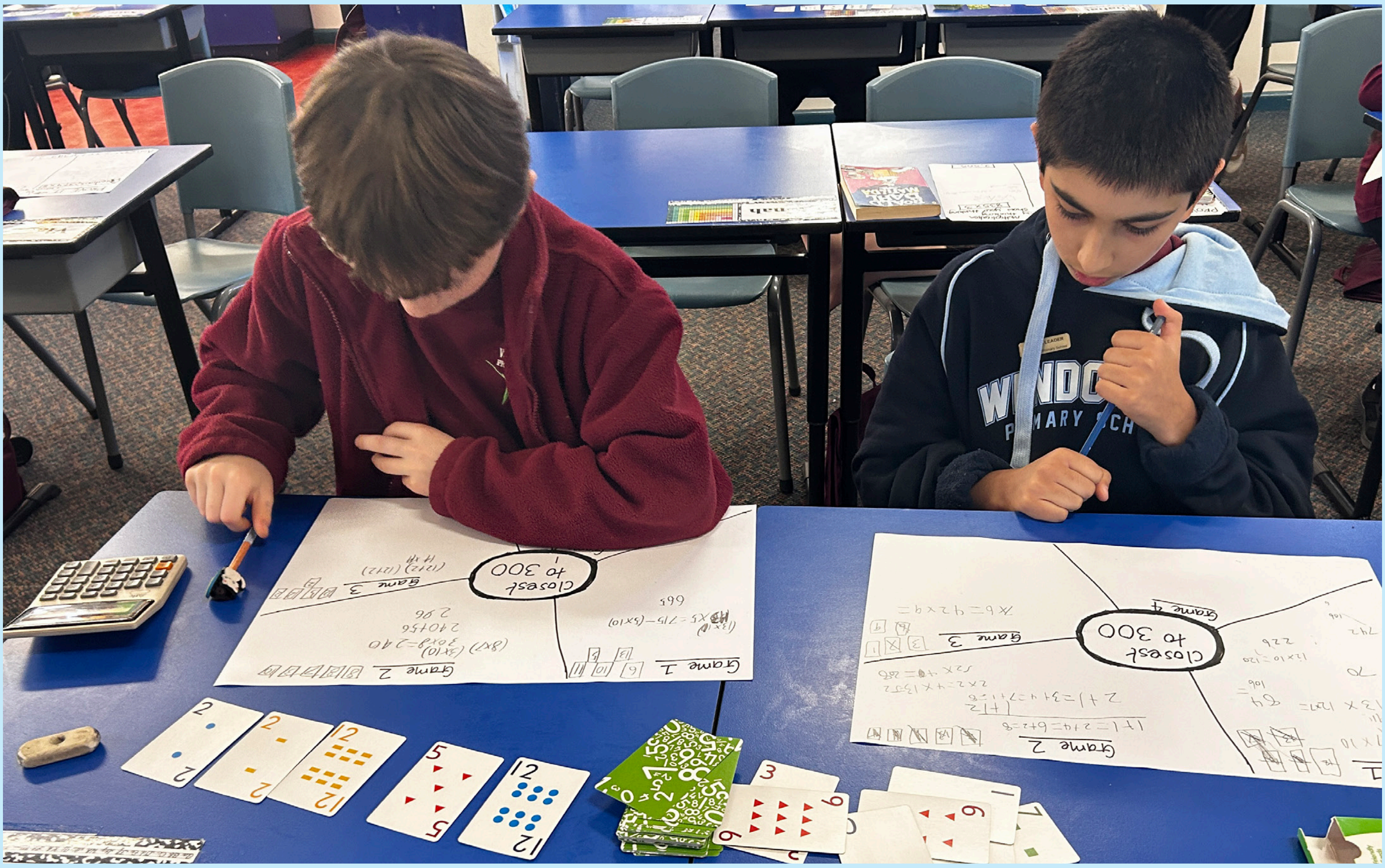


Figure 2. Students play Closest to 300 using their understanding of order of operations.

Our very first accredited Maths Active Teacher is Donna McNeight from Wendouree Primary School. I've had the privilege of seeing Donna's work both in and beyond her classroom, and what stands out most is her genuine love of mathematics and her deep belief that every student can succeed in it.

Donna brings mathematics to life by helping students see it in the world around them. She is committed to ensuring students can confidently apply their mathematical thinking in real situations. Donna's classroom culture values curiosity, discussion and purposeful reasoning.

Donna has made a significant contribution to strengthening students' reasoning, particularly through her innovative use of Reasoning Boards, which she has shared with the wider profession through MAV's *Prime Number* journal (see the Term 3 edition for a great article on retrieval activities). Her work shows how structured opportunities for thinking and discussion can transform students' confidence and depth of understanding.

Beyond her own classroom, Donna has contributed to broader professional conversations, including her involvement in the AAMT *Strength in Numbers* podcast. This reflects her willingness to share practice, learn with others, and advocate for high-quality mathematics teaching.

What makes Donna such a deserving inaugural Maths Active Teacher is not just her expertise, but the care and intention she brings to her work every day. She consistently centres students as capable thinkers and actively builds their confidence to engage with mathematics in meaningful ways.

It is a pleasure to recognise Donna's contribution; she truly embodies what it means to be a Maths Active Teacher.

To celebrate the 300th edition of *Common Denominator*, we asked Donna to join in the 300 fun with her Year 5/6 class at Wendouree Primary School. I knew her class would be up for the excitement and deep thinking about a number and Donna set about planning for a learning experience that would be fit for all learners in her class and challenge them to apply their knowledge deeper.

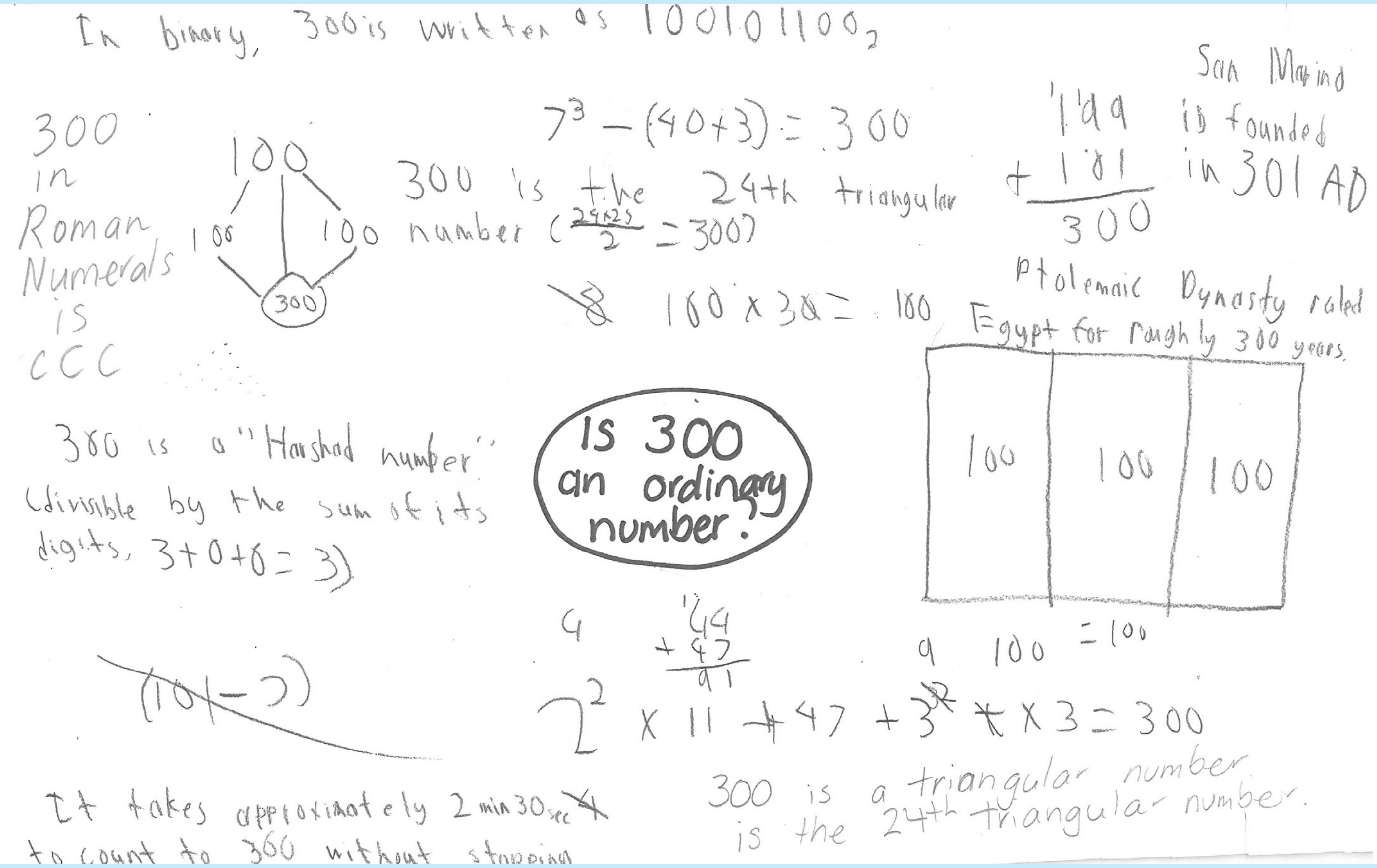
DONNA'S REFLECTION ON THE 300 CHALLENGE WITH HER CLASS

For our warm-up activity, the students played *Closest to 300*. Working in partners, students took turns flipping over five cards each and then used those cards, along with their understanding of the order of operations, to create an equation. The students were given a set amount of time to explore the numbers in different ways.

The student whose equation produced a number closest to 300 won the round. The game involved persistence, trial and error, and mental calculation strategies as students explored different combinations and operations to achieve the best possible result. It was an effective retrieval activity that allowed students to revise and strengthen their understanding of BODMAS in an engaging and collaborative way. I moved around the classroom observing which students were

MATHS ACTIVE TEACHERS (CONT.)

Renee Ladner, MAV and Donna McNeight, Wendouree Primary School



Figures 3. A student's work sample of the 300 Mind Map where students investigated the properties of 300.

able to successfully create equations using BODMAS independently.

Following this, students were posed the question, 'Is 300 an ordinary number?', which was written on the whiteboard. Using mini whiteboards, they discussed with their partners what they knew about the number 300. Initially, this prompted many addition and subtraction responses as students explored different ways to represent the number. The students were then challenged to prove whether 300 was ordinary or special. A list of prompts was displayed, giving students starting points and enabling them to broaden their thinking.

Students began to explore the number more deeply and challenge each other's ideas using mathematical language. They discussed a range of concepts, including factors, multiples, place value, odd and even numbers, and patterns, while justifying their reasoning and building on one another's responses. Their ideas were presented on a mind map, which was continually added to as they worked together. This encouraged rich mathematical discussion

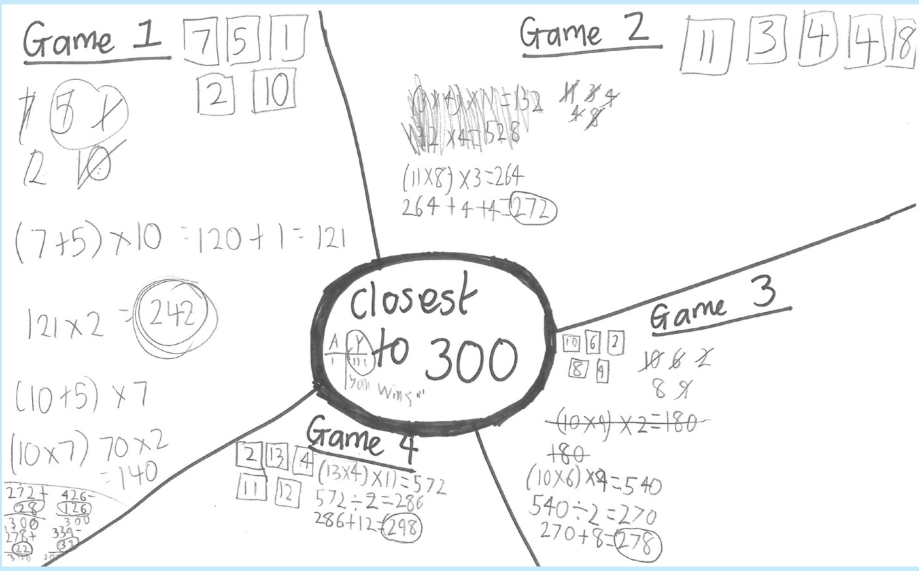


Figure 4. Students' workings from the Closest to 300 game.

and helped develop students' confidence in communicating their mathematical thinking.

To build on the students' engagement in the activity, they continued their investigation using laptops. This enabled students to expand their ideas by exploring the significance of the number 300 beyond mathematical equations. Students discovered a range of interesting facts, including the binary representation of 300, that 300 is a perfect score in ten-pin bowling, and that it is a Harshad number. This helped students make connections between mathematics and the wider world while encouraging curiosity, research skills, and deeper mathematical thinking.

As a way of collating the students' learning, their information was added to a large canvas with the number 300 displayed in the centre. Each student contributed their own 'wow' fact to the display. This was a fabulous way to visually represent the students' thinking in an engaging and collaborative manner, where all students were able to contribute and celebrate their learning. Contributions were very broad, with many making connections to the Victorian Curriculum 2.0 across Levels 5 and 6. In addition, all students discovered real-world contexts where the number 300 was significant, further strengthening their understanding of how mathematics connects to everyday life.

To build on the positive atmosphere that was engulfing the classroom, the 300 *Balloon Challenge* was introduced. Students were challenged to blow up 300 balloons within a specific time limit. This activity acted as a celebration of the hard work and enthusiasm the students had demonstrated throughout the lesson, while also promoting teamwork, perseverance, and excitement. (See Figure 1 on page 1.)

To conclude the lesson, students completed an exit ticket that reinforced the learning that had taken place throughout the session. The exit ticket provided students with an opportunity to reflect on their discoveries and communicate their understanding of the significance of the number 300, while also allowing the teacher to gather valuable formative assessment data to inform future learning experiences.

DO YOU HAVE WHAT IT TAKES?

Applications for MAV's Maths Active Teacher accreditation are open to any Victorian registered teacher (early childhood through to VCE). Maths Active Teachers receive a official certificate recognising the accreditation as well as a tile for LinkedIn and the Maths Active Teacher icon to display in your email signature. This accreditation signals to your school, community and network that you are demonstrating effective teaching and learning practices in mathematics. It's also a great addition to your CV.

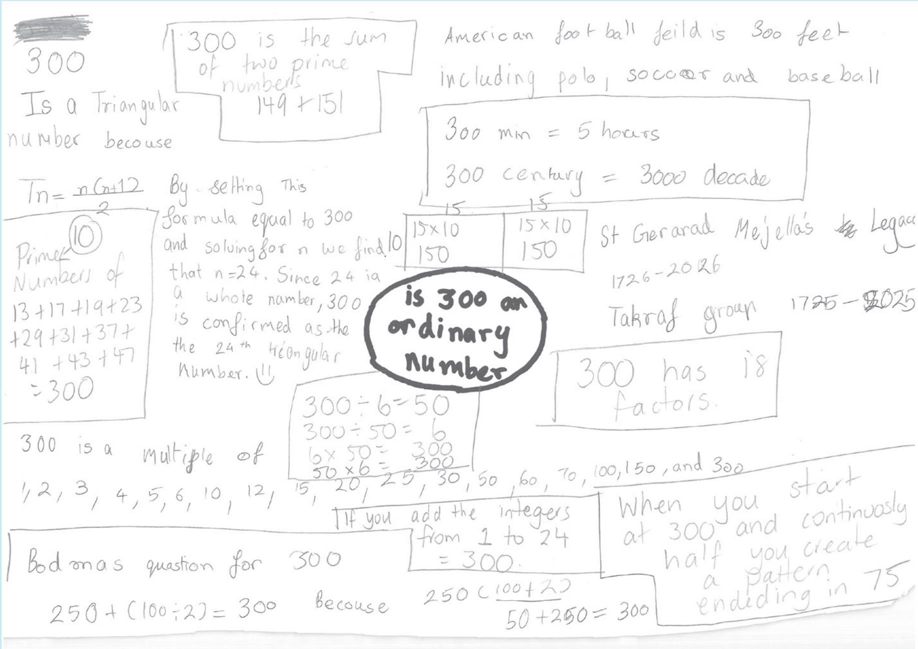


Figure 5. A student's work sample of the 300 Mind Map.

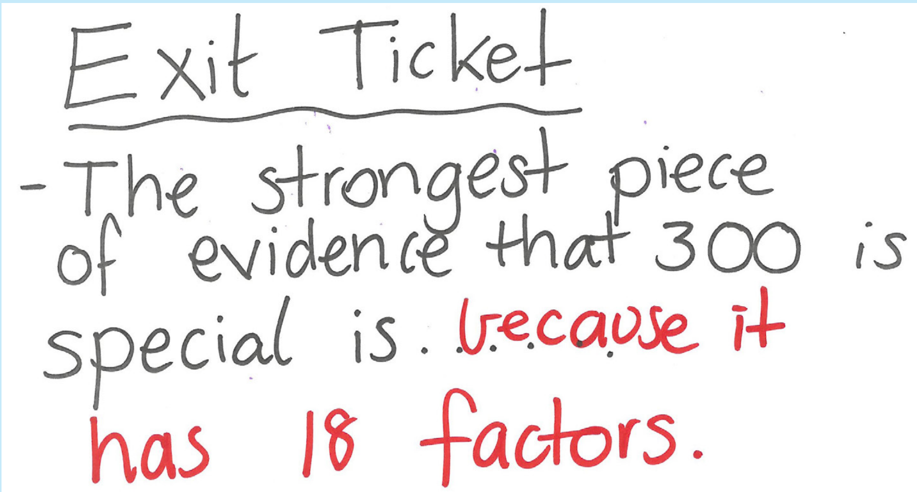


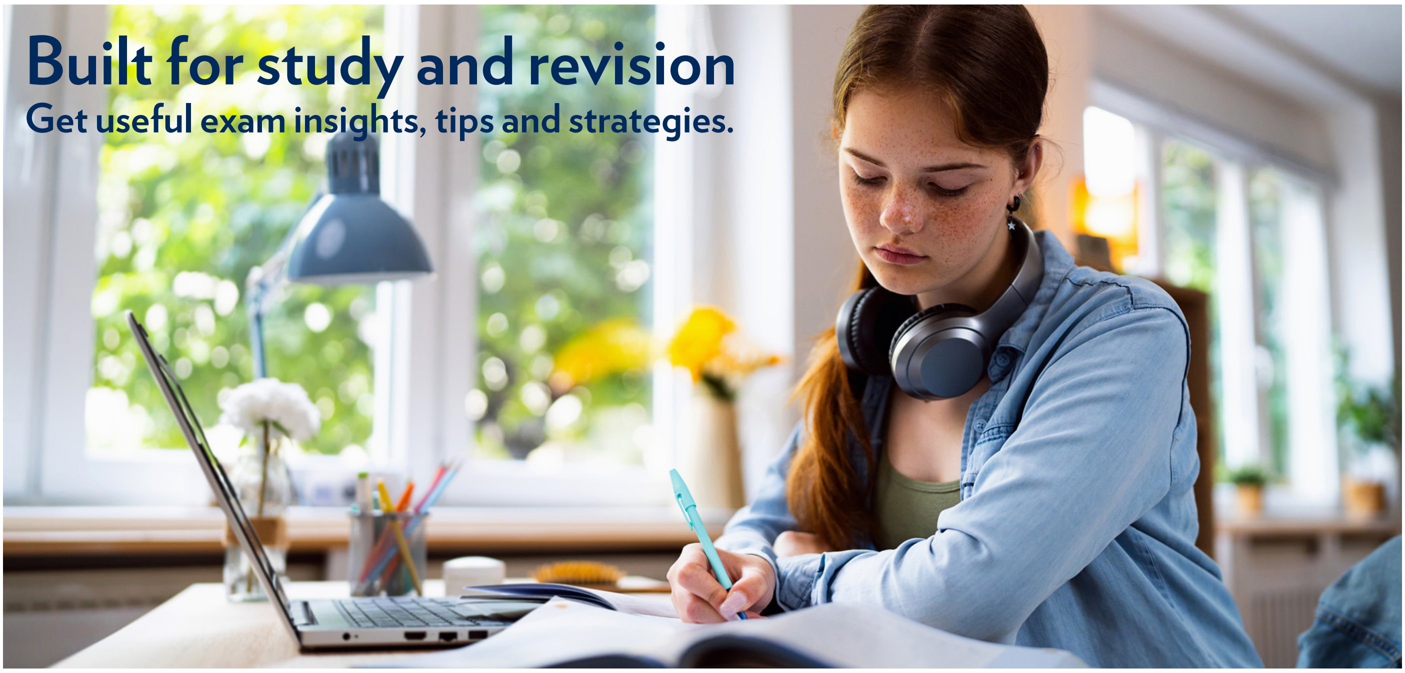
Figure 6. A completed exit ticket.

COULD YOU BE ACCREDITED AS A MATHS ACTIVE TEACHER?

Turn your everyday classroom practice into recognised excellence by becoming a Maths Active Teacher. For more information go to www.mav.vic.edu.au/Membership/Maths-Active-Teacher or contact Renee, rladner@mav.vic.edu.au.

MATHS ACTIVE TEACHER

VCE REVISION PROGRAM 2026



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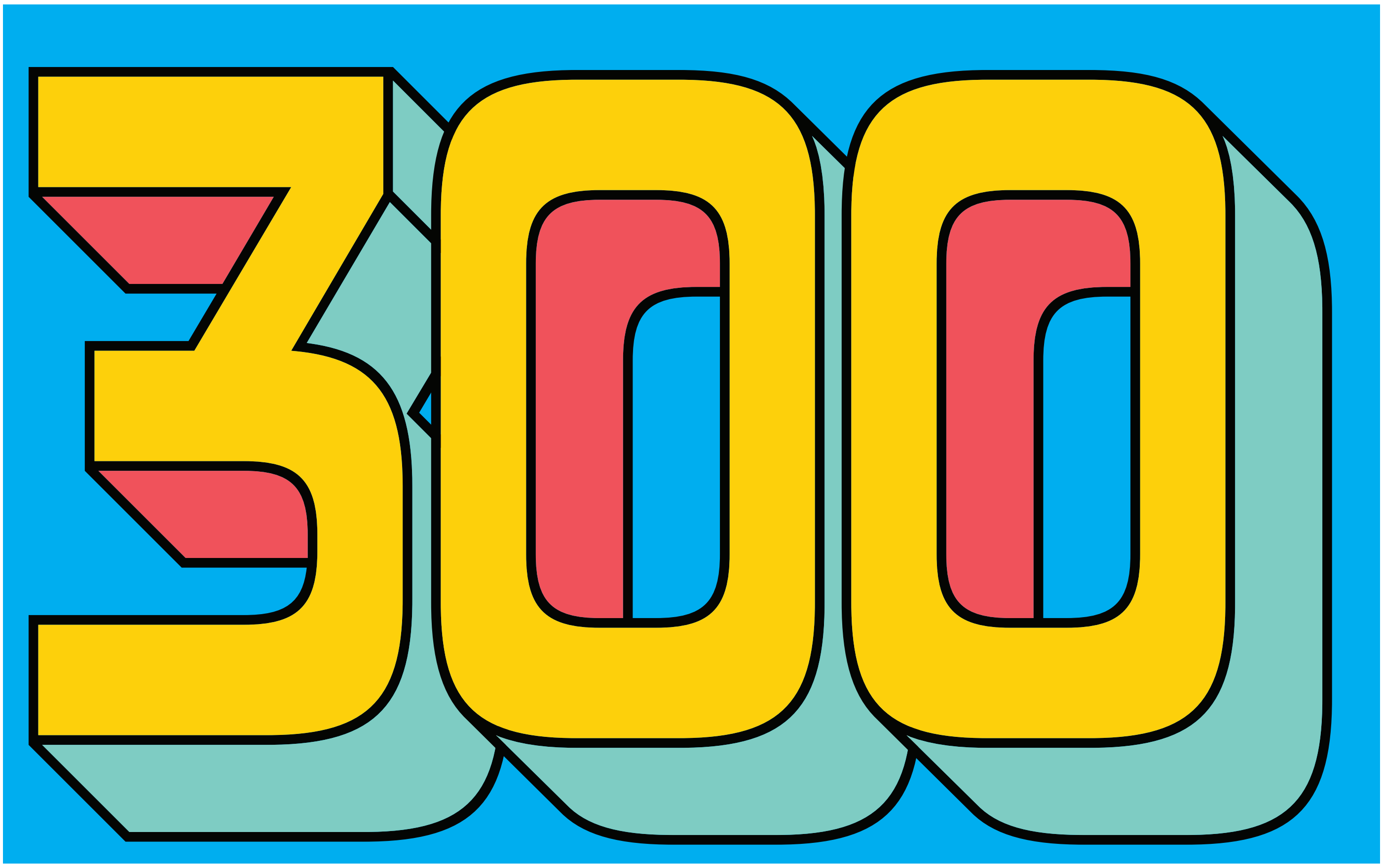
THE MATHEMATICAL ASSOCIATION OF VICTORIA

300, 120 AND OTHER NUMBERS

Roger Walter



Last year I wrote an article about the year 2025. This year there are two important numbers. As this is the 300th edition of *The Common Denominator*, we will first look at the number 300. However, we have recently celebrated the 120th year of the MAV, so let's also investigate 120, as well as seeing how 300 and 120 can interact. On the way, I also found a new and systematic way to find Pythagorean triads, which I believe you will find interesting.

2026

Firstly, a brief look at this year, 2026.

2026 = 2×1013 and 1013 is a prime number, so (unlike 2025) there is not a lot of promise. From 2026 you can make 2026 as
$2^0 + 2^6 = 65 = 5 \times 13$ (prime factors).

If we include the '$2 \times$' above we get $2 \times 5 \times 13 = 10 \times 13$. Next, multiply by each base (in turn) to give $(10 \times 2) \times (13 \times 2) = 20 \times 26$.

This may seem a little contrived, but it is amazing what you can come up with if you use your imagination, combined with a little creativity.

There are some special days for 2026, some of which unfortunately have already passed. The only Australian palindromic date is 6/2/26, but in America 6/2/26 (June 2) is also a palindrome, as is 6/20/2026 (June 20, USA). Pi days and *e* days will be the same as for most years.

300

So, what about 300?

$300 = 2^2 \times 3 \times 5^2$, powers of the first three prime numbers. It is also the sum of twin primes, 149 and 151.

300 is the 24th triangle number.

300 cannot be written as the sum of two squares. This can be proved using remainders after division by 4. The square of an even number must be a multiple of 4. An odd number is 1 more than an even number, so when squared, it becomes even $\times$ even $+ 2 \times$ even $+ 1$.

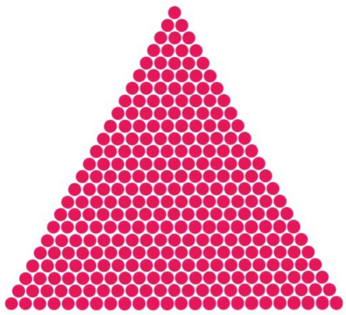


Figure 1. 300 is the 24th triangle number.

(even + 1) $\times$ (even + 1) = even $\times$ even + 2 $\times$ even + 1

Even $\times$ even and 2 $\times$ even are both multiples of 4 so the square of an odd number will always leave a remainder of 1.

300 can only be the sum of two odd numbers squared if its remainder after dividing by 4 is $1 + 1 = 2$.

The case of two squared even numbers is more complex, but can be found in Wikipedia and other websites. 300 can be written as the sum of three squares.

300, 120 AND OTHER NUMBERS (CONT.)

Roger Walter

$300 = 2^2 + 10^2 + 14^2 = 10^2 + 10^2 + 10^2$

I hope the second one is obvious. Can you find any more?

You can get other sums of squares by progressively subtracting squares, some of which should be reasonably large.
For example,

$300 - 256 = 131$

$131 - 121 = 10 = 9 + 1$

$300 = 16^2 + 11^2 + 3^2 + 1^2$.

What about the difference of squares? There is some interesting mathematics here.

If $300 = x^2 - y^2$, then $300 = (x + y)(x - y)$. The average of $x + y$ and $x - y$ is x. Therefore if you can split 300 into two factors which have a whole number average (x), you can express it as the difference of two squares.

For example, $300 = 30 \times 10$. The two brackets could equal 30 and 10. The average of the two brackets is 20 and

$$\begin{aligned} 300 = 30 \times 10 &= (20 + 10)(20 - 10) \\ &= 20^2 - 10^2. \end{aligned}$$

In how many other ways can 300 be written as the difference of two squares?

Obviously a lot of numbers can be written as the difference of two squares. This leads to the question, what kinds of numbers can be written this way? What kinds of numbers can not be written this way? Can prime numbers be written as the difference of two squares?

Finally, can you see a way to use this method to find Pythagorean triads (like 3, 4, 5)? This is explained in the answers on page 11.

120

This is also an interesting number and has a lot in common with 300. $120 = 2^3 \times 3 \times 5$, also powers of the first three prime numbers. It is also the sum of twin primes, 59 and 61. 120 is also the 15th triangle number and 15 is the fifth triangle number. 120 is the fifth factorial. $5! = 1 \times 2 \times 3 \times 4 \times 5 = 120$

120 AND 300

The first part of this material is taken from a presentation by Peter Fox at MAVCON 2025.

$300 = 120 = 2^2 \times 3 \times 5^2 = 2 \times 2 \times 3 \times 5 \times 5$

$120 = 2^3 \times 3 \times 5 = 2 \times 2 \times 2 \times 3 \times 5$

We can place these factors on a Venn diagram with the common factors (2, 2, 3) in the overlapping part. Note that in this case, 2, 2, 3 means that two occurs twice.

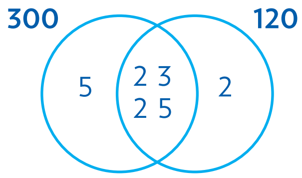


Figure 2. Showing the prime factors of 300 and 120 on a Venn diagram.

The overlapping part of the diagram above shows the factors the two circles have in common, i.e., the common factors. The highest common factor is $2 \times 2 \times 3 \times 5 = 60$. All the numbers in the diagram must be included in any number which is a multiple of both numbers (a common multiple). Therefore the smallest, or lowest common multiple must be $2 \times 2 \times 2 \times 3 \times 5 \times 5 = 600$.

This can be used for adding or subtracting fractions.

$$\frac{7}{300} + \frac{11}{120} = \frac{7 \times 2}{300 \times 2} + \frac{11 \times 5}{120 \times 5} = \frac{69}{600}$$

600 is the LCM and the 2 and 5 are the factors in the Venn diagram outside the common factors.

TRIPRIME NUMBERS

I also enjoy what I would like to call triprime numbers, or numbers whose prime factors are only the first three prime numbers 2, 3 and 5. They include a lot of the smaller numbers, but become more spaced out as the numbers increase.

2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20…

300 and 120 are both triprime numbers, and if you add 180, another triprime number, to 120, you get 300. This kind of thing will happen with some frequency because of the large number of common factors.

What kinds of properties or patterns do these numbers exhibit? Are they interesting? Only you can decide.

NUMBERS OF INTEREST

In 1945, in the American journal *The American Mathematical Monthly*, Edwin F. Beckenbach suggested that every natural number is 'interesting'. A proof of this is summarised below.

Every number is either interesting or uninteresting. If at least one uninteresting number exists, then there must be a smallest uninteresting number. This fact, however, makes it an interesting number, a contradiction! Therefore there are no uninteresting numbers!

You may like to ask your students whether this light hearted argument is valid. A critical factor is how you define a number as interesting. More generally, how can we be sure any mathematical proposition is true?

In 1918, the English mathematician G. H. Hardy commented to the Indian mathematician Srinivasa Ramanujan that the number of his taxi, 1729, was 'rather a dull one'. Ramanujan immediately replied that no, it was actually very interesting, because it is the smallest number that can be written as the sum of cubes in two different ways. 1729 is so interesting it has even appeared in a number of episodes of *Futurama*! It should not be too difficult for your students to find these two ways. It may be also challenging for you, or your students to give each other a number, with the challenge to show how it might be interesting.

OTHER NUMBERS

A lot of this is just fun, although you never know when some new mathematics may turn out to have a useful application.

Happy numbers

If you start with a number, you can produce another number by adding the squares of its digits. Repeating this process will produce more numbers, which will either end with 1, in which case the number is 'happy' or repeat which would define it as 'sad'.

$300 = 3^2 + 0^2 + 0^2 = 9$

$9 = 9^2 = 81$

$81 = 8^2 + 1^2 = 65$

Are 300 and 120 happy? You will find that they take awhile to make up their mind, but neither are happy.

$300 \to 9 \to 81 \to 65 \to 61 \to 37 \to 58 \to 89 \to 145 \to 42 \to 18 \to 65\ldots$

$120 \to 5 \to 25 \to 29 \to 85\ldots$

Of course you immediately realise that 85 and 58 will produce the same set of numbers and that therefore 120 will end up repeating the same numbers as 300.

You or your student(s) may wonder whether it is possible for one of these sequences to increase indefinitely, as many sequences do. However, once a number gets sufficiently large, it must produce a smaller number. For example, 9999 will produce four 81s, making the next number 324, followed by 29, leading to the 120/300 repeats.

This leads to the question of what could be the biggest number in a happy number sequence. First thoughts are that it can be as big as you like, because you can start as big as you like. A more interesting question would be to find the biggest possible number which is not part of a decreasing process. This would have to be the biggest number formed from a smaller number.

ANSWERS

300 as the sum of squares

$17^2 + 3^2 + 1^2 + 1^2,\ 16^2 + 6^2 + 2^2 + 2^2,$
$13^2 + 11^2 + 3^2 + 1^2,\ 15^2 + 5^2 + 5^2 + 5^2,$
$14^2 + 8^2 + 6^2 + 2^2,$ and more.

300 as the difference of squares

$300 = 76^2 - 74^2 = 28^2 - 22^2 = 20^2 - 10^2$

All odd numbers can be written as the difference of squares because their factors are both odd (including primes).
For example,
$45 = 9 \times 5 = (7 + 2)(7 - 2) = 7^2 - 2^2$ and

$31 = 31 \times 1 = (16 + 1)(16 - 1) = 16^2 - 1^2.$

Clearly, all prime numbers except 2 can be written as the difference of squares, one of which must be 1.

All multiples of 4 – other than 4 itself – can be can be written as the product of two different even numbers and hence can be the difference of squares.

Even numbers which are not multiples of 4 can only have an odd and an even factor and so cannot be the difference of squares.

If you list the squares in increasing order, you get 1, 4, 9, 16, 25, 36, …

the differences between consecutive terms are 3, 5, 7, 9, 11, …

As well as reinforcing our previous conclusion, it also shows that every odd number can be written as the difference of *consecutive* squares. And there is a lot more!

Pythagorean triads

The previous answer is not quite the full story. 4 can only be 4×1 or 2×2, neither of which qualify. However you can find all the Pythagorean triads by systematically splitting up the square numbers, starting at 9, into the difference of two squares.

$3^2 = 9 = 9 \times 1 = (5 + 4)(5 - 4)$

$\therefore\ 3^2 = 5^2 - 4^2 \Rightarrow 5^2 = 3^2 + 4^2$

$4^2 = 16 = 8 \times 2 = (5 + 3)(5 - 3)$ leading again to (3, 4, 5)

$25 = 5^2 = 25 \times 1 = (13 + 12)(13 - 12)$

$\therefore\ 5^2 = 13^2 - 12^2 \Rightarrow 13^2 = 5^2 + 12^2$

The first one with more than one expansion is $12^2 = 144 = 72 \times 2 = 36 \times 4 = 24 \times 6 = 18 \times 8$ giving (12, 35, 37), (12, 16, 20), (9, 12, 15), (5, 12, 13) so only one that is really new. This tells us that every whole number except for 1 and 2 must appear in at least one Pythagorean triad! (A square plus 1 or a square plus 4 cannot equal another square.)

Happy number sequences

Any three digit number $100a + 10b + c$ will produce $a^2 + b^2 + c^2$.

$(100a + 10b + c) - (a^2 + b^2 + c^2)$

$= 100a - a^2 + 10b - b^2 + c - c^2$

The smallest possible value of $100a - a^2$ is 99 when $a = 1$.

$10b > b^2$ as $b < 10$ and the smallest value of $c - c^2$ is -72 when $c = 9$, so this expression must be positive and therefore any three digit number must produce a smaller number.

The 300 sequence produces 89, almost the biggest possible two digit number, giving 145. What about 99? We would need $99 = a^2 + b^2$. A quick check of the possibilities revels that this cannot happen, so if you start with 99, the second number will be 162, followed by one or two digit numbers.

Using the method for finding the sum of squares equal to a number (99) we find that 933 and 755 (digits in any order) will produce 99, but this is part of the natural decrease. The largest number produced by an *increase* in a happy number test sequence is 145. This information allows us to list all possible end results (repeating patterns and 'happy') of testing for happy numbers.

I found this an interesting investigation and hope that you did too and can use part or all of it with your students.

Numbers of interest

You can find the cubes by progressively subtracting cubes from 1 to half of 1729 and seeing whether the answer is another cube. There are only nine of these and you should get

$1729 - 1^3 = 1728 = 12^3$

$1729 - 9^3 = 1000 = 10^3$

(Students may recognise 1000 and 729 as cubes.)

$\therefore\ 1729 = 12^3 - 1^3 = 10^3 - 9^3$

Finally, congratulations to *Common Denominator* on 300 issues and to MAV for 120 years of service to the mathematical community.

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SAC DEVELOPMENT IN VCE MATHS

Danijela Draskovic, MAV Education consultant and James Mott, Centre for Higher Education Studies

Across Foundation, General, Methods and Specialist, School Assessed Coursework (SAC) is a source of genuine professional complexity. There's something about SACs that consistently trips people up – even experienced teachers.

When the time comes to draft a task, teachers are managing competing pressures simultaneously: alignment with VCAA requirements, cohort needs, marking workload, and timetable constraints. Somewhere in the middle of all this, the mathematical thinking that SACs are meant to elicit can easily become an afterthought.

Many SACs look fine on paper. The structure is there, the questions flow, and everything appears appropriate for the topic.

Yet a significant number do not fulfil the purpose that VCAA intends. They rely too heavily on closed, procedural questions, guide students too closely, and produce responses that are largely indistinguishable from one another. So, while they read well, they're not really doing the job they're supposed to do.

THE PURPOSE OF A SAC

A widespread misconception is to treat SACs as a form of in-class examination. That's not surprising. Exams are familiar, controlled, and relatively easy to mark. You know what kind of responses you'll get, and you know how to rank them.

SACs are an occasion within VCE Mathematics when students engage with an idea over time, make decisions about method and direction, and communicate their reasoning in a sustained way. They are not a test of procedural reproduction under time pressure, though they must still produce a reliable ranking. It is precisely this dual obligation, to be both open enough to reveal mathematical thinking and structured enough to produce defensible marks, that makes SAC design genuinely difficult.

A STRUCTURE THAT WORKS

Most effective SACs, across all four studies, follow a similar progression, even if they appear quite different on the surface. They begin with a clear, accessible entry point: early questions are concrete and attainable without additional guidance.

Closed questions have a legitimate role here: they provide structure and establish momentum. The issue isn't their inclusion, but rather it's when they dominate the task.

From this foundation, the task should progressively withdraw its scaffolding, requiring students to exercise judgement: determining what information is relevant, selecting a method, deciding what to explore, and justifying decisions in context.

In Methods and Specialist, this shift frequently takes the form of moving from a specific, worked case to a generalisation. In General Mathematics, it is more often reflected in how students select, interpret or prioritise data in an applied context. In Foundation, the same structural move is required, even though it is frequently avoided: students must make decisions about representation, approach and justification, not simply follow a guided sequence of steps, even when the underlying mathematics is more accessible.

The underlying principle is consistent across all four studies: at some point in the task, the instructions must stop leading.

HOW MUCH STRUCTURE IS TOO MUCH?

Calibrating the amount of structure in a SAC is where a significant amount of the professional judgement sits. An over-structured task produces consistent, tidy responses that are straightforward to mark but reveals very little about how students think. When responses are largely indistinguishable, the task has eliminated the variation SACs are designed to surface; this is the design pattern most likely to raise concerns in a VCAA audit.

A task that is too open creates the opposite problem: a proportion of students make no meaningful progress, the assessment period is consumed by repeated clarification, and results are difficult to mark reliably.

There is no formula for finding the right balance, but there are useful diagnostic signals. If completed responses are largely indistinguishable, the task is too closed. If the teacher found themselves repeatedly explaining the task during the assessment, it was too open.

In practice, the most effective adjustment is often modest: a single open question, or a choice between two valid approaches, can shift the character of a task without abandoning the structure most students need.

Providing constraints, such as satisfying specified criteria, in open-ended questions can provide students with boundaries within a question to make meaningful progress while being able to make choices within the question, such as what methods they may use, how they represent information, and what values they choose to work with.

ATTRIBUTES OF EFFECTIVE SACS

Regardless of study or year level, a well-designed SAC should demonstrate four qualities:

Explanation of reasoning. Students must justify what they are doing and why it is appropriate in context, not simply show working. VCAA performance descriptors across all studies treat the communication of reasoning as a distinct and assessable dimension of achievement.

Genuine decision-making. The task must contain at least one moment where there is no prescribed next step and the student must make a call: selecting a method, identifying relevant information, or choosing how to represent an outcome. Without this, the teacher is observing the capacity to follow instructions, not mathematical thinking.

Connection between ideas. Students should draw on more than one concept or skill, even in a simple way, rather than working within a single isolated process.

Variation in responses. If the 'correct' response can only be produced one way, the task is almost certainly too closed. Sufficient flexibility must exist for different approaches to emerge and be meaningfully distinguished in marking. It is also worth noting that length is not a reliable indicator of quality. A task spanning many pages of closed, sequential questions may be far less effective than a shorter, more carefully constructed task that requires genuine decision-making.

INTRODUCING CHOICE WITHOUT LOSING CONTROL

One practical mechanism for generating authentic variation in student responses is the deliberate inclusion of choice. This might involve allowing students to select a dataset, choose a parameter value within a specified range, determine how to represent their findings, or identify which of two valid methods to pursue. The choice does not need to be large, just significant enough that responses begin to diverge.

There is a real trade-off here, and it should be acknowledged. Increased variation in responses creates increased complexity in marking. Not all variation is meaningful: some choices will produce responses that are simply different rather than more or less sophisticated.

THE PROBLEM WITH UNMODIFIED COMMERCIAL TASKS

Resources such as MAV SAC starters are professionally developed and extremely valuable. However, they are not designed to be used without substantial modification. Running an unmodified commercial task creates three distinct problems.

A compliance issue: VCAA requires that tasks reflect the specific cohort and teaching program of the school.

A validity issue: a task not calibrated to how the content was taught will not produce a meaningful spread of achievement, and the ranking it generates will not reflect what students actually know.

An integrity issue: when multiple schools use the same task with minimal changes, information circulates between students, and authentication becomes difficult to sustain.

A SAC should reflect the students in front of the teacher, not a generic cohort imagined by a publisher.

DIFFERENCES ACROSS STUDIES

While the underlying principles are consistent, their expression shifts across the studies. In Mathematical Methods and Specialist Mathematics, application tasks and modelling or problem-solving tasks formally require formulation, solution and interpretation.

SACs should produce responses that address the general case, not merely a specific numerical instance. In General Mathematics, applied context is central, but context alone does not make a task open: a task set in a real-world scenario can still be structurally closed and procedural. In Foundation Mathematics, VCAA specifies investigations spanning one to two weeks incorporating formulation, exploration and communication as distinct components. The risk here is over-correction: in pursuing accessibility, teachers can inadvertently eliminate the thinking. Accessibility and cognitive demand are not in opposition. The question across all four studies remains: are students making decisions, or simply following instructions?

IT COMES DOWN TO JUDGEMENT

There is no template that resolves the challenge of SAC design. Every task involves a series of decisions that are specific to a cohort, a teaching program, and a particular moment in the school calendar.

The balance that worked well in one year may need significant adjustment the next, if the cohort is different or the topic is taught at a different time.

What experienced teachers recognise is that SAC design is itself a form of mathematical thinking: it involves identifying constraints, working within them, making justifiable decisions, and reflecting critically on whether the outcome does what it was meant to do.

STIMULATING THINKING

Jessica Kurzman, MAV consultant

A picture sparks 1000 maths concepts! Use this picture as a prompt to stimulate thinking. If you have other ideas for investigations or lessons that could stem from the ideas here, add them to the conversation on our social channels. You can find us on Facebook and Instagram @maths.vic, LinkedIn @ maths-vic and on X, @maths_vic.

EARLY YEARS

- When I look at this picture, I can see a three, and 2 zeroes. Go for a walk around the room / outside and find the number 3. Each time you find the number 3 put a tick on your paper. Then, turn over your paper and do the same for the number 0. Which digit did you find the most?
- Have you even heard the word 'hundred' before? Where have you heard it? What does it mean?
- This picture of 300 has been created using lollies. What words could you use to describe how many lollies are in the picture? (For example: lots, heaps, many, a bunch, a pile, loads, so many, a mountain, a giant group, a tonne.)
- If you used the word lots to describe the amount of lollies in this picture, what words could you use to describe the opposite of lots? (For example: a few, not many, a little bit, hardly any, only some, a small amount, not a lot.)
- Draw circles to match the colours of 3 different lollies. Cut them out and stick them in a line, starting with your favourite colour and ending with the colour you like the least.
- How big do you think one of these lollies is? What words could you use to describe the size of 1 lolly? (For example: tiny, teeny, little, small, mini, extra small.)
- It is exciting to celebrate 300 issues of this magazine. It is like having a birthday celebration! How old will you be on your next birthday? Can you write the number to show how old you are turning, and draw that many candles on a birthday cake? After you have drawn the candles, what else could you draw to show that number? Maybe some circles, flowers, stars, balloons, trees, or even lollies?
- If you had a pile of red lollies and a pile of blue lollies, could you make a pattern? Use red and blue counters to show a pattern you could make using red and blue lollies.

FOUNDATION - YEAR 2

- What are some numbers that are less than 300? What are some numbers that are greater than 300? Write as many numbers as you can in a table with the headings 'Less than 300' and 'Greater than 300'.
- What could we collect 300 of? How could we organise what we collect to make it easy to count? Give it a go and explain what you did to someone else.
- In the picture, there are lots of different coloured lollies. Choose 3 colours (use counters or unifix blocks) and create a pattern that repeats. Ask someone if they can continue your pattern. Can you continue someone else's pattern?
- Work with a group and build towers that altogether show 300 blocks. What is the best number of blocks to have in each tower to make it easy to count? Why?
- Imagine you had a small box of coloured lollies like those in the picture. If there were 20 lollies in the box, how many might be each colour? How many different possibilities can you come up with? Draw a picture, make a table or write an equation to show each answer you come up with. Can you come up with more than 5 different answers?
- Let's make a paper chain to celebrate our 300th edition! We need 300 links in our chain and we have 2 different colours to use. How can we arrange the colours so we can check that we have 300 without having to count 1 by 1?
- Imagine the 300 picture made from lollies is real. If you close your eyes and pick one lolly, how would you describe the chance of it being red? Explain your thinking. What about green **or** blue? What about red, blue **or** green? What is more likely, less likely, or certain? Why? You could also think about other combinations like: not blue, red **or** green, or any colour you choose. For each one, explain your reasoning.

YEARS 3 - 6

- If a magazine is published 4 times per year, and has been published 300 times, for how many years has the magazine been published? What if it was published 6 times per year? 7, 8 or 9 times per year?
- To celebrate our 300th edition, we wanted to have a celebration of cakes with candles. We realised that 300 candles would be way too many candles to have on one cake! We decided to have multiple cakes, but since we love maths, each cake had to have the same number of candles on it. How many cakes might we have had, and how many candles would be on each cake? How many different possibilities can you come up with?
- If between 5000 and 6000 copies of the magazine are sold each time it is published, and the profit made per magazine sold is $2.25, what is the range of profit that could be made each time it is published? How many magazine need to be sold to make a profit of $12,600?
- The combined age of 4 people is 300. What might their individual ages be? How many different combinations can you come up with? What if one of the people is a parent of one of the others? How does that impact the possibilities?
- We were given $300 to spend on a party! What percentage of the money should we spend on food, drinks, decorations and entertainment?
- Based on your percentages, how much money does that mean we will spend on each? Come up with 4 different percentage combinations, and matching dollar amounts.
- If you were given the chance to design the 300th edition of a mathematics magazine, what would your front cover look like? How creative can you be without using the number 300?
- Can you find all the factors of 300? How do you know you have found them all?

YEARS 7 AND ABOVE

- Create an image where the perimeter is 300cm and the area is 300cm^2. How many different images can you create that fit this criteria?
- I started a bank account 10 years ago, and I deposited $300. I did not deposit any more money, however, each year I earnt 3% interest. How much money did I have in my account after 5 years? How much do I have now? How much will I have in another 5 years? How many years after opening the account, would I have $400? Draw a graph to show the amount of money in my bank account over 20 years.
- How many different ways can 300 be written as the product of 2 or more numbers?
- If you roll a dice 300 times, what results would you expect? What is the theoretical probability? How close would you expect the experimental results to be to theoretical probability? Why? Test it out and see what happens!
- This is the 300th edition of this magazine. Each edition has contained several articles. How long might it take to read all the articles from the first 300 editions? Make some assumptions, based on the following to help come up with your answer:
    - How many articles are in each edition
    - How many pages are in each article
    - How long it takes to read one page
- A social media post gets 300 likes. If the likes increase by 15% each day for 7 days, how many likes would the post have after 7 days? 10 days? 20 days? How many days would it take to reach 1000 likes, assuming it continues to grow by 15% every day?
- A scoring system uses only increments of 7, 11, and 15. What combinations of these scores could total exactly 300? Is there more than one solution? Prove it!
- If you had $300 in Australian currency, what would this amount be equivalent to in five other currencies from around the world? Show your calculations clearly for each conversion.
- If the celebration for the 300th edition is being held in Melbourne, Australia at 1345 hours on 31 July 2026, and special guests from around the world are joining online, what local date and time will they need to join in their own time zones to ensure they don't miss the start of the celebration? Select five locations from five different countries to help solve this problem.

SURFACE TO DEEP LEARNING

Melissa Dann - Practice Coach, Early Childhood Management Services

FINGER COUNTING IS DEEP MATHEMATICAL LEARNING

There is a familiar moment in many early childhood settings where educators verbally count the number of children at group time. From an administrative and safety perspective, this practice is necessary, we need to know who is present and accounted for. However, there is another way to make this routine moment of coming together at group time, a supportive and effective mathematical experience that supports children's understanding of number.

When children are learning to count, the aim is not simply for them to recite numbers in order, but to develop a deep and flexible understanding of what numbers represent. In early childhood settings, counting forms the foundation for later mathematical thinking, and the way we approach it has a lasting impact. For many children, early counting begins as surface-level learning and while rote counting can be a starting point, it is only one small part of becoming numerate. They may be able to say number words in sequence but not yet fully understand that numbers relate to quantities or can be used to describe, compare, and make sense of the world around them. To support this depth of learning, educators must begin where children are. Through observation of what children do, say, make, draw, and write, educators can gain insight into children's current understandings and intentionally plan for their next steps of learning. When expectations extend beyond a child's current understanding, such as asking a child who is learning to count small numbers to count much larger amounts, children may disengage.

But how far is too far?

The Early Years Learning Framework v2.0 defines numeracy as the capacity, confidence and disposition to use mathematics in daily life. This definition reminds us that counting is not about how far children can count, but about how they make meaning from numbers, by connecting number words to objects, noticing patterns, and using numbers with purpose. Looking at the Victorian Mathematics Curriculum 2.0, learning about number beyond 20 (to 120) is an outcome for the end of Level 1.

Figure 1. The routine starts by asking children to hold up three fingers.

The Foundation Level descriptor states that by the end of Foundation (the first year of formal schooling) children should be able to, name, represent and order numbers, including zero to at least 20, using physical and virtual materials and numerals.

These expectations reinforce a slower, more intentional approach to early mathematics learning. In early childhood education, there is no need to rush children to rote count larger and larger numbers. Instead, educators have time to slow down, and focus on developing strong mathematical foundations. Through intentional, play-based teaching, children can build deep conceptual understanding by connecting numbers to quantities and real-life experiences.

This article introduces a simple counting routine that can be used during everyday moments, such as group time, to transform necessary counting into a rich mathematical experience. The routine is designed to support children to move beyond rote counting, making numbers visible, meaningful, and connected, while building confidence and deep understanding over time.

COUNTING USING FINGERS: A DAILY 4 MINUTE COUNTING ROUTINE

As children begin to transition to group time, I introduce a counting routine that involves children using their fingers to count. I have found this teaching strategy to be very successful in engaging children in counting, whilst also providing formative assessment of their knowledge in an intentional way that remains playful.

I begin by asking the children to show me three fingers. As the children are holding up their fingers, I further prompt them, 'Are you sure?' 'How do you know you have three?' 'What could you do to prove it to me?'

I encourage the children to count along with me as we count and check .... '1, 2, 3'. This provides me with the opportunity to model the correct quantity of three to the word three. If a child has the incorrect number of fingers they have the ability to self-correct. This strategy enables children to explain their thinking and think deeply about the number three and how it can be represented, supporting reasoning and mathematics confidence, just like the EYLF v2.0 highlights in Outcome Five – Children are effective communicators.

We continue this routine by asking 'Show me 5 fingers'.... 'Show me 1 finger'... 'Show me 7 fingers'.

We intentionally count and check to support accuracy in the moment and to foster positive dispositions towards mathematics learning. Getting the right answer the first time is not the goal; rather, it is developing the confidence and willingness to try again that truly matters. This approach encourages persistence and builds confidence as children become curious, engaged and actively involved in their learning. These behaviours reflect learning dispositions that support success well beyond the classroom.

Through this practice, children deepen their understanding of key counting principles, including one to one correspondence, the stable order principle and cardinality. Once children are confident with connecting number names to quantities, we begin to incrementally build foundational concepts such as decomposing numbers into parts of a whole. I ask the children to 'Show me 6 fingers'

A child might hold up 3 fingers on one hand and 3 on the other.

Then I will ask: 'Can you show me another way to make 6?'

Some children will turn their fingers into the numeral 6, which is correct, but then we look and notice other children who might have 1 and 5, or 2 and 4.

We discuss and record the various combinations that can be made to represent six.

As their learning continues this routine can be adapted to introduce the concepts of addition and subtraction. Over time, we intentionally introduce and model specific mathematical language related to addition and subtraction to support children's conceptual understanding.

'Show me 3 fingers, can you add two more. How many do you have now?'

'Show me 6 *plus* 3. How many do you have?'

'Show me 1 *more than* 7. How many now?'

'If you have 3 and 4 more how many do you have *altogether*? '

'Show me 10, *take away* 2'

'Show me 4 *minus* 1'

'Show me 8, now show me 3 *fewer*'

When children use their fingers to count, they are developing their internal number line. Through this process, they begin to understand relationships between numbers, for example, that four is one more than three and one less than five. Finger counting also helps children learn that numbers can be manipulated and composed in different ways. In fact, research by Krenger and Thevenot (2025) found that finger counting acts as a developmental scaffold for efficient mental arithmetic.

For children who are already proficient in addition and subtraction to 10, learning can progress to counting concepts related to doubling and halving and the exploration of growing patterns. To support these children, and to inform your teaching practice, the Victorian Mathematics Curriculum can be used when developing individual learning plans. Mathematics is a continuum, and the Victorian Mathematics Curriculum, alongside the Early Years Learning Framework v2.0, provides clear guidance on 'where to next', supporting all children's learning regardless of their current stage.

Mathematics learning, like all learning, is most effective in a safe and supportive environment where mistakes are viewed as part of the process and participation is encouraged. Children benefit from repeated, meaningful opportunities to practise new skills, and it is often simple, consistent routines that have the greatest impact on building confidence and understanding.

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SHRIRO | CASIO | EDUCATION

fx-8200 AU II

THE BEST CALCULATOR FOR VCE FOUNDATION MATHEMATICS IS AVAILABLE TO PURCHASE THIS JULY

• Open the Table app

b. Two venues, A and B, are being considered for the celebration. The costs for each venue are as follows:

- Venue A – $135 per person, all inclusive
- Venue B – $75 per person plus a fixed cost of $3200

Find the minimum number of guests required to guarantee Venue B is the cheaper option. 2 marks

• Press f(x)

• Press ③ to Define f(x) using x

① f(x)
② g(x)
③ Define f(x)
④ Define g(x)

• repeat for g(x)

f(x)=135x

g(x)=75x+3200

• Press Tools ⋯

• choose ① Table Range

Table Range
Start :0
End :200
Step :10
Execute

Table Range
Start :40
End :60
Step :1
Execute

$135x > 75x + 320$

for $x = 53$

A = $7155 B = $7175

for $x = 54$

A = $7290 B = $7250

$\therefore$ min. is 54 guests

	x	f(x)	g(x)
4	30	4050	5450
5	40	5400	6200
6	50	6750	6950
7	60	8100	7700

50

Initial exploration - Sol is b/w 40 and 60

	x	f(x)		g(x)
12	51	6885	<	7025
13	52	7020	<	7100
14	53	7155	<	7175
15	54	7290	>	7250

54

Table refined to see Solution is $x = 54$

LE TOUR DE FRANCE

Renee Ladner, Education consultant, MAV

Figure 1. The peloton climbing the difficult road to Alpe-D'Huez, during the stage 18 of Le Tour de France 2013.

Every July, millions of people around the world follow the Tour de France, one of the most iconic sporting events on the planet. Over three weeks, cyclists race across France, sometimes venturing into neighbouring countries, climbing mountains, sprinting on flat roads and covering long distances day after day.

The scale of the event is remarkable. It is estimated that around 12 million people attend stages of the Tour de France, with approximately 3.5 billion viewers worldwide watching on television (Guinness World Records). While the race is often associated with physical endurance and speed, it is also underpinned by a significant amount of mathematics. From measuring distance and time to analysing data and making strategic decisions, maths plays a central role in how the race is organised and ultimately won.

This article explores how the Tour de France can be used as a rich, real world context for teaching mathematics from Foundation to Year 7 and beyond, offering provocations that support engagement, reasoning and curriculum connections.

WHAT IS THE TOUR DE FRANCE?

The Tour de France is a professional multi stage cycling race held annually since 1903, with interruptions during the World Wars. The modern race typically consists of 21 stages over 23 days, covering approximately 3,300–3,500 kilometres.
Key features of the race include:

Stages

- Flat stages, suited to sprinters
- Mountain stages, favouring climbers
- Time trials, where riders race individually against the clock

Teams: Riders compete as part of teams, supporting one another strategically, but they are ranked individually.

Timing: The overall winner is the rider with the lowest cumulative time across all stages.

Classification jerseys

- Yellow jersey: overall leader
- Green jersey: points leader (sprints)
- Polka dot jersey: best climber
- White jersey: best young rider (under 21)

Each of these features offers opportunities to explore key mathematical ideas in authentic and meaningful ways.

Unpacking the Tour de France in your classroom could provide an engaging entry point for students to see the connections between mathematics and sport.

FOUNDATION – YEAR 2

For younger students, the Tour de France provides engaging opportunities to develop early number concepts.

Recording race positions: Students record which riders finish first, second and third in each stage, using tally marks to track results and compare performance across stages.

Interpreting and organising time data: Students read simple stage times and order riders from fastest to slowest.
Times can be rounded to the nearest minute to support grouping and estimation.

Sharing and grouping: Race based scenarios support equal sharing. For example, if 24 energy gels are shared among 8 riders, students use counters or blocks to model their thinking.

LE TOUR DE FRANCE (CONT.)

Renee Ladner, Education consultant, MAV

Figure 2. Ascent of the famous route to Alpe d'Huez.

Adding and subtracting riders: Students practise addition and subtraction by adding or removing riders or teams, calculating totals and making comparisons.

Exploring the tour route: Using maps, students trace the race route and discuss how riders travel from stage to stage.

Applying locational and directional language: Students describe movement using terms such as left, right, up and down, later progressing to north, south, east and west.

Describing movement and turns: Students identify changes in direction along the route and explain how riders navigate different stages.

Constructing directions: Students create step by step written or oral directions using locational language so another person could follow the course.

Classroom checkpoints: 'Stage checkpoints' are set up around the classroom. Students give clear instructions to guide a partner between checkpoints.

Comparing distances and climbs: Students compare stage distances or mountain climbs, ordering them and discussing relative difficulty.

Representing and analysing results: Students graph stage results and identify patterns, using the data to predict which rider might perform best overall.

YEARS 3–6: OPERATIONS, TIME AND GRAPHS

As students develop fluency with the four operations, the Tour de France becomes a powerful context for calculation, comparison and estimation.

Finding the total distance of the tour: Students estimate and then calculate the total distance of all stages, using strategies such as grouping, partitioning or adding in parts.

Estimating crowd numbers: Students estimate attendance at each stage and calculate totals across stages, supporting reasonableness checking and efficient computation.

Exploring combinations: Using multiplication, students calculate the number of possible outfit combinations, such as jerseys, shorts and helmets.

Comparing finishing times: Students calculate the difference between riders' times and interpret what the differences reveal about performance.

Measuring angles of climbs: Students measure and compare the angles of different climbs using protractors or digital images, ordering them from smallest to largest and classifying their steepness.

Exploring speed: Students learn that speed is calculated using Speed = Distance ÷ Time. Using real race examples, they compare riders' average speeds and consider how distance and time interact.

Problem solving: Example questions could include:

- If a rider travels 180 km in 4.5 hours, what is their average speed?
- How much total time is saved if a rider finishes 30 seconds faster across three stages?

Figure 3. The 3333km route of the 2026 Tour de France.

These tasks encourage reasoning and clear explanations of thinking.

YEARS 7 AND BEYOND

Exploring gear ratios: Students investigate how gear ratios, expressed as front teeth : back teeth, affect cycling performance and effort.

Linking gear ratios to distance: Students calculate the distance travelled per pedal revolution using gear ratio and wheel circumference.

Comparing gear setups: Different gear combinations are analysed to determine suitability for flat stages versus mountain climbs.

Extending to algebra: Students express relationships between gear ratio, wheel circumference and distance travelled using algebraic expressions.

Linking cadence and speed: Students explore how cadence, measured in revolutions per minute, and gear choice influence speed, reinforcing connections between rate, distance and time.

Data representation and analysis: Students work with race datasets, organising and interpreting information such as stage times and time gaps.

Measures of centre and spread: Mean, median and range are calculated to summarise performance and compare riders.

Consistency versus peak performance: Students compare riders with steady performance to those with occasional very fast times, discussing how this impacts race outcomes.

Interpreting results: Questions such as *Is the fastest rider always the winner?* are explored using evidence.

Extending statistical thinking: Students may investigate interquartile range or compare results across different conditions.

Student led inquiry: Students pose their own questions, choose appropriate statistical methods and communicate conclusions.

HOW THE TOUR DE FRANCE CAN MATTER IN MATHEMATICS CLASSROOMS

Using the Tour de France as a learning context:

Shows mathematics in real life: Students see mathematics used by athletes, teams and organisers, supporting relevance and authenticity.

Connects learning across contexts

- Sport: analysing results, times and performance
- Geography: maps, routes and distances
- Health: nutrition, energy and physical effort
- Technology: data collection and visual representation

Encourages positive learning behaviours: Students develop curiosity, engage in discussion, justify reasoning and make connections across learning areas.

Broadens students' view of mathematics: Mathematics is positioned as a tool for reasoning, problem solving and understanding the world.

FINAL THOUGHTS

The Tour de France is far more than a cycling race. It is mathematics in action, measuring, calculating, analysing and making decisions at every turn of the road.

For students from Foundation to Year 7 and beyond, it provides a rich and engaging way to see how mathematics helps us make sense of the world. Whether counting riders, measuring climbs or analysing performance data, the Tour de France reminds us that mathematics is everywhere, even on two wheels.

Digging into the Tour de France is a great springboard for a mathematical investigation: Could I ride the Tour de France in 100 days? Could a rider win the race without winning a stage? How would an e-bike perform on the Tour route?

The Maths Talent Quest runs every year, now is a great time to begin planning your 2027 investigations.

BOOK REVIEW

Kelli Simmons, Learning leader, Ed Partnerships

Making Maths Count: Exploring Maths Concepts in Real-World Contexts is a practical and classroom-focused resource designed for primary teachers.

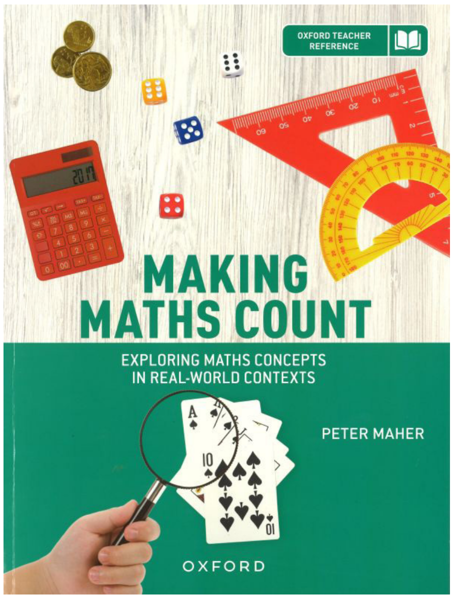
The book contains 17 units with more than 170 relevant activities aligned to the Australian Curriculum Mathematics strands. Activities within each unit are sequenced from simpler tasks to more complex challenges, although year levels are not explicitly identified. This flexible structure makes the resource easy to navigate and adaptable across different year levels and classroom contexts.

A strength of the text is the inclusion of key mathematical ideas at the beginning of each unit. These sections support teachers' content knowledge while connecting learning to meaningful real-world contexts. The activities could effectively complement a whole-school mathematics program and offer opportunities to strengthen home-school partnerships through authentic tasks.

The pedagogical approach underpinning the book draws on the ideas of Jean Piaget, Richard Skemp and Confucius, emphasising active engagement and the development of deep mathematical understanding. Learners are encouraged to create, consider, conceptualise, and communicate their thinking. The four mathematics proficiencies are evident throughout the activities, particularly reasoning and problem-solving.

Overall, this is a valuable professional resource for teachers seeking inquiry-based learning, rich tasks, student discussion, differentiation, real-world relevance and engaging mathematical investigations.

Making Maths Count is available from the MAVshop. Members receive a generous discount on every purchase. www.mav.vic.edu.au/MAV-Shop



ONE MINUTE: JAMES RUSSO

I'M…

James Russo, an educator and researcher based at Monash University.

I WAS DRAWN TO MATHEMATICS EDUCATION…

Because I've always loved thinking about numbers. Once I became a primary school teacher, it quickly became the one space where it felt like all sorts of magic was possible.

ACADEMIA ALLOWS ME TO…

Largely do what I want, which is work alongside primary school teachers (my favourite people) and to help energise primary mathematics classrooms with engaging tasks and learning experiences.

A GREAT ENTRY POINT FOR ENGAGING IS…

A well-chosen mathematical game. Games are also a great entry point for getting students problem solving, collaborating, and investigating.

MY FAVOURITE GAME…

Changes constantly! Perhaps *The King's Tax* (my brother's invention). It is an adaptation of *Greedy Pig*. It can be differentiated for students of all ages, and engages everyone.

PUTTING STUDENTS AT THE CENTRE…

Involves seeing yourself as part of the community of learners. That way the entire community is at the centre.

MATHS SHOULD BE…

Most students' favourite core subject in primary school, if it's taught the way it could be.

DIFFERENTIATION WORKS…

Through choosing rich tasks and activities, and adapting the learning experience with enabling and extending prompts as required.

THE WAY STUDENTS FEEL ABOUT MATHS…

Is influenced by how their teacher feels about teaching the subject.

CHALLENGING TASKS…

Are part of a well-balanced mathematical diet. And that diet can vary depending on the appetite of the teacher and their students.

TEACHERS CAN…

Create powerful memories that people carry with them for a lifetime.

STUDENTS COLLABORATING…

Is key to a student flourishing in any mathematics classroom.

SEQUENCING LEARNING…

Is probably the one thing that occupies most of my thinking about task and learning design. It allows us to plan for connection-making.

THE BEST RESOURCE FOR THE CLASSROOM IS…

The students and the teacher, and their collective energy and ideas.

I COULDN'T LIVE WITHOUT…

Dice of every variety, a deck of cards and coffee. As well as meditation, walking, and stimulating conversation.

I'D NEVER PLAY…

A game I couldn't get excited about.

ASSESSMENT SHOULD…

Try to measure what we value, help us know our students, and not get in the way of a good lesson.

A GREAT MATHS LESSON…

Has the room buzzing and everyone so absorbed they can't let it go.

MY MOST INSPIRATIONAL TEACHER…

Lynn Bok. My first mentor who empowered every 'little person' in her Prep community in powerful ways that I cannot capture in words.

300 IS MORE THAN A NUMBER

Nabihah Muhammad Munir, Year 8 student at Ilim College

Figure 1. Year 9 student, Nuha Azam, created this artwork to celebrate Common Denominator's 300th edition.

The number 300 is to some, a number, a calculation or a date. So, I set out to explore if the number 300 is only a number or might it be a little more interesting than first thought?

It's quite a special number. Well, it has several interesting aspects. Mathematically, it is the sum of two prime numbers (149 + 151), and it is also the sum of ten consecutive prime numbers (13 + 17 + 19 + 23 + 29 + 31 + 37 + 41 + 43 + 47). In history, according to the ancient Greek writer and historian Herodotus, 300 Spartans resisted one million Persian invaders during the Battle of Thermopylae (480 BC), which became the subject of the Warner Brothers historical action movie *300*. After the events at Thermopylae, the word 'ephialtes' entered the Greek language, meaning 'nightmare,' or to describe someone as the ultimate traitor.

According to spiritual interpretations from sources like numerologysign.com and sunsigns.org, the 300-angel number is a divine message urging you to overcome a lack of clarity, trust your intuition, and focus on present happiness rather than worrying about the future. It symbolises spiritual support, encouraging you to love those around you, show gratitude, and embrace new beginnings, often acting as a reminder that you are on the right path. Now in modern day life, it represents a perfect score in bowling and the lowest credit rating one can get in credit scoring. It's also approximately said that an American football field (excluding the endzones) surprisingly, is exactly 300 feet long.

For those who use Roman numerals it's known as CCC. It also has a square root which is 17.32 and the cube root is 6.69. The number 300 is also a significant number having only 1 significant figure.

It's interesting to consider 300 in a deeper way, to see it differently, view it from another perspective and learn more about it.

To me, the number 300 is something more than a number or a numeral. It's a date, a movie, a calculation and the sum of two primes. The number 300 was worth investigating.

Ilim College is an accredited Maths Active School. Thank you to Nabihah and Nuha for their reflections on 300.

Any Victorian registered school (primary, secondary and P-12) can apply for Maths Active School accreditation. This is a tangible way to demonstrate excellence in the teaching and learning of mathematics.

The application form and assessment rubric is available at www.mav.vic.edu.au/Membership/Maths-Active-Schools.

If your school is interested in applying or if you'd like to learn more about Maths Active School accreditation, email Renee Ladner, rladner@mav.vic.edu.au.

300 ISSUES OF THE MAGAZINE

Darinka Rob, Administration manager, MAV

This is the 300th edition of Common Denominator. In this reflection, Darinka Rob traces the evolution of the magazine.

The story of *Common Denominator* begins long before its first issue appeared in 1984. Its roots can be traced back to 1945, with the publication of *The Australian Mathematics Teacher*, a journal that laid the foundation for a vibrant professional conversation among mathematics educators. The NSW Branch of the Mathematical Association received numerous requests for a journal that would serve both as a medium for exchanging ideas and experiences in the teaching of elementary mathematics, and as a source of guidance for teachers on trends and developments in mathematics education in Australia and overseas.

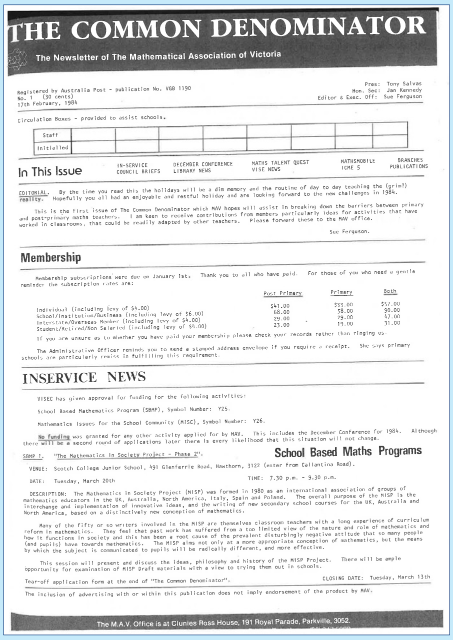
The journal received immediate and enthusiastic support from teachers of mathematics across the other Australian states, reflecting a shared desire for collegial exchange and collective professional growth. This response highlighted the need for a national forum in which teachers could communicate across geographic and institutional boundaries, share classroom practices, discuss common challenges, and learn from one another's experiences. The journal fostered collaboration among teachers and strengthening a professional community devoted to the advancement of mathematics education.

Although war-time restrictions on the supply of paper would not permit the production of a large journal, the editorial committee aimed to include:

Articles: In-depth discussions of mathematics teaching and learning, focusing on pedagogy, curriculum, classroom practice, and emerging ideas to support professional reflection and improvement.

Mathematical notes: Short, focused pieces exploring specific mathematical topics, problems, or methods, offering insights that strengthen both subject knowledge and teaching practice.

Reviews: Critical evaluations of textbooks, teaching resources, and publications to help teachers make informed choices and maintain high educational standards.



THE COMMON DENOMINATOR

The Newsletter of The Mathematical Association of Victoria

Registered by Australia Post - publication No. VGB 1190
No. 1 (30 cents)
17th February, 1984

Pres: Tony Salvas
Hon. Sec: Jan Kennedy
Editor & Exec. Off: Sue Ferguson

Circulation Boxes - provided to assist schools.

Staff								
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In This Issue: IN-SERVICE, COUNCIL BRIEFS, DECEMBER CONFERENCE, LIBRARY NEWS, MATHS TALENT QUEST, VISE NEWS, MATHSMOBILE, ICME 5, BRANCHES, PUBLICATIONS

EDITORIAL. By the time you read this the holidays will be a dim memory and the routine of day to day teaching the (grim?) reality. Hopefully you all had an enjoyable and restful holiday and are looking forward to the new challenges in 1984.

This is the first issue of The Common Denominator which MAV hopes will assist in breaking down the barriers between primary and post-primary maths teachers. I am keen to receive contributions from members particularly ideas for activities that have worked in classrooms, that could be readily adapted by other teachers. Please forward these to the MAV office.

Sue Ferguson.

Membership

Membership subscriptions were due on January 1st. Thank you to all who have paid. For those of you who need a gentle reminder the subscription rates are:

	Post Primary	Primary	Both
Individual (including levy of $4.00)	$41.00	$33.00	$57.00
School/Institution/Business (including levy of $6.00)	68.00	58.00	90.00
Interstate/Overseas Member (including levy of $4.00)	29.00	29.00	47.00
Student/Retired/Non Salaried (including levy of $4.00)	23.00	19.00	31.00

If you are unsure as to whether you have paid your membership please check your records rather than ringing us.

The Administrative Officer reminds you to send a stamped address envelope if you require a receipt. She says primary schools are particularly remiss in fulfilling this requirement.

INSERVICE NEWS

VISEC has given approval for funding for the following activities:

School Based Mathematics Program (SBMP), Symbol Number: Y25.

Mathematics Issues for the School Community (MISC), Symbol Number: Y26.

No funding was granted for any other activity applied for by MAV. This includes the December Conference for 1984. Although there will be a second round of applications later there is every likelihood that this situation will not change.

School Based Maths Programs

SBMP 1. "The Mathematics In Society Project - Phase 2".

VENUE: Scotch College Junior School, 491 Glenferrie Road, Hawthorn, 3122 (enter from Callantina Road).

DATE: Tuesday, March 20th TIME: 7.30 p.m. - 9.30 p.m.

DESCRIPTION: The Mathematics in Society Project (MISP) was formed in 1980 as an international association of groups of mathematics educators in the UK, Australia, North America, Italy, Spain and Poland. The overall purpose of the MISP is the interchange and implementation of innovative ideas, and the writing of new secondary school courses for the UK, Australia and North America, based on a distinctively new conception of mathematics.

Many of the fifty or so writers involved in the MISP are themselves classroom teachers with a long experience of curriculum reform in mathematics. They feel that past work has suffered from a too limited view of the nature and role of mathematics and how it functions in society and this has been a root cause of the prevalent disturbingly negative attitude that so many people (and pupils) have towards mathematics. The MISP aims not only at a more appropriate conception of mathematics, but the means by which the subject is communicated to pupils will be radically different, and more effective.

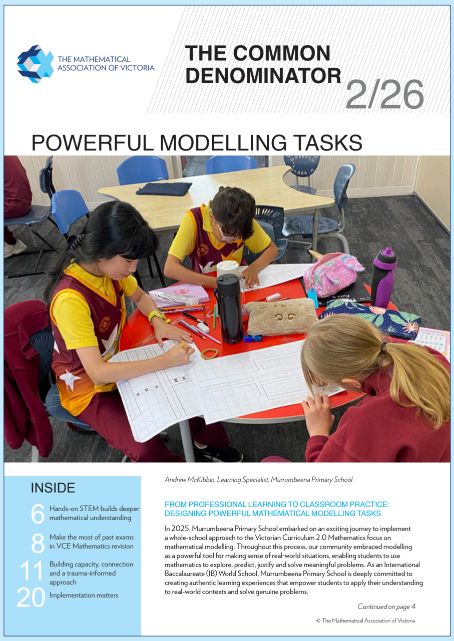
This session will present and discuss the ideas, philosophy and history of the MISP Project. There will be ample opportunity for examination of MISP Draft materials with a view to trying them out in schools.

Tear-off application form at the end of "The Common Denominator". CLOSING DATE: Tuesday, March 13th

The inclusion of advertising with or within this publication does not imply endorsement of the product by MAV.

The M.A.V. Office is at Clunies Ross House, 191 Royal Parade, Parkville, 3052.

Figure 1. The first edition (1984).



THE MATHEMATICAL ASSOCIATION OF VICTORIA

THE COMMON DENOMINATOR 2/26

POWERFUL MODELLING TASKS

INSIDE

6 Hands-on STEM builds deeper mathematical understanding

8 Make the most of past exams in VCE Mathematics revision

11 Building capacity, connection and a trauma-informed approach

20 Implementation matters

Andrew McKibbin, Learning Specialist, Murrumbeena Primary School

FROM PROFESSIONAL LEARNING TO CLASSROOM PRACTICE: DESIGNING POWERFUL MATHEMATICAL MODELLING TASKS

In 2025, Murrumbeena Primary School embarked on an exciting journey to implement a whole-school approach to the Victorian Curriculum 2.0 Mathematics focus on mathematical modelling. Throughout this process, our community embraced modelling as a powerful tool for making sense of real-world situations, enabling students to use mathematics to explore, predict, justify and solve meaningful problems. As an International Baccalaureate (IB) World School, Murrumbeena Primary School is deeply committed to creating authentic learning experiences that empower students to apply their understanding to real-world contexts and solve genuine problems.

Continued on page 4

© The Mathematical Association of Victoria

Figure 2. Today's contemporary magazine.

Gleanings: Brief items of interest drawn from Australian and international sources, highlighting noteworthy ideas, developments, and trends in mathematics education.

Notices and activities: Information about meetings, conferences, and activities of branch associations in Australian states and New Zealand, fostering communication, participation, and professional collaboration.

Over the decades, *The Australian Mathematics Teacher* fostered a sense of community, collaboration, and shared purpose – similar values that would later shape the creation of *Common Denominator*. The inaugural issue of the magazine contained just eight pages and was carefully prepared on a typewriter (see Figure 1).

By the time I joined The Mathematical Association of Victoria in 2006, the tools had changed, but the spirit of the publication remained much the same.

Computers had replaced typewriters, and I created the magazine using Microsoft Word, it continued as a concise eight-page publication, printed every three months. The magazine's commitment to sharing ideas and supporting mathematics educators endured.

As MAV's membership expanded, *Common Denominator* has grown into a resource that is anticipated and valued by many mathematics educators. The aesthetic has undergone many refinements and has been shaped by our talented graphic designer and editor, Louise Gray. Her vision for how the magazine can best support our members continues to evolve, with a clear focus on showcasing strong practice.

MAV is grounded in the belief that educators do the very best they can with the resources available to them. By sharing insights into effective practices, *Common Denominator* aims to inform and positively influence our collective practice.

While I am no longer involved in preparing the content of the magazine, my connection to it remains strong. I take great pleasure in coordinating the quarterly distribution, carefully inserting each issue into envelopes and ensuring that every school receives its copy on time, ready for the first week of a new term. In this way, I continue to be part of the magazine's journey, supporting the same community it has served for decades.

If you would like to submit an article to a future edition of *Common Denominator*, please email office@mav.vic.edu.au.

MAV REGIONAL TOUR REFLECTION

Di Liddell, Education Manager, MAV

BUILDING FUTURES TOGETHER: BENDIGO AND MOE

The 2026 MAV Regional Tour was grounded in a clear purpose: strengthening relationships, deepening content knowledge, and refining frameworks for teaching and learning. Visiting Bendigo and Moe, the tour offered an opportunity not only to share ideas and resources, but to listen closely to the experiences of teachers working in regional contexts.

In the lead-up to the tour, MAV invited regional members to share their professional learning priorities through a survey. With almost 100 responses received, this feedback directly shaped the program. The result was a tour that reflected the interests, needs and realities of regional schools, reinforcing the value of responsive and locally informed professional learning.

BEGINNING ON COUNTRY

Each day began with a Welcome to Country, reminding participants of the importance of place, connection and respect. MAV extends sincere thanks to Peta Hudson, Djaara Traditional Owner from the Dja Dja Wurrung Clan, and Linda Mullett, Kurnai Elder from Gippsland, for sharing their knowledge and perspectives. These moments invited reflection and gratitude for the land on which we live, work and learn.

PRIMARY STREAM: MULTIPLE PATHS TO LEARNING

The Primary teaching stream opened with an engaging conversation by Emeritus Professor Di Siemon (RMIT University). Drawing on over 30 years of research and experience in teacher education, Di shared insights into what we know about effective mathematics teaching and learning. Her key message resonated strongly with participants: there is no single 'best way' to teach mathematics.

Di highlighted the many pathways students take as they develop mathematical understanding and challenged assumptions that can sometimes underpin mandated approaches. Teachers were encouraged to value professional judgement, flexibility and responsiveness when making instructional decisions.

PLANNING, PRACTICE AND BIG IDEAS

Across the Primary program, a consistent message emerged: great teaching begins with great planning. Sessions focused on practical, high-impact strategies that support clarity, confidence and informed decision-making in the classroom.

Participants explored the purposeful use of manipulatives, considering when they genuinely support conceptual understanding and when their use may, unintentionally, limit deeper learning. A strong emphasis was also placed on big ideas in mathematics, particularly within Number. Teachers reflected on the importance of prioritising concepts that take time to develop, acknowledging that not all curriculum content is of equal importance and that deep learning cannot always be achieved in neatly packaged lesson-sized segments.

VCE AND VOCATIONAL PATHWAYS

The VCE stream supported teachers across Foundation Mathematics, General Mathematics and Mathematical Methods, with sessions focused on VCE assessment, including exam preparation, SAC development, and optimising CAS use in examinations. Unfortunately, Specialist Mathematics did not run at the regional venues due to low enrolments.

New to the 2026 program was a dedicated Vocational Numeracy stream, responding to increasing interest in applied and pathway-focused mathematics. This stream explored ways to design authentic, meaningful numeracy learning experiences aligned with vocational contexts and student goals.

Teachers explored CAS technologies in targeted sessions. Thanks to CASIO and Texas Instruments for their support in facilitating practical, hands-on learning.

LISTENING TO REGIONAL VOICES

One of the most important outcomes of the tour was the opportunity to listen. Teachers spoke about the unique strengths of regional schools, including strong community connections and close professional relationships, while also naming ongoing challenges such as workload, isolation and access to resources.

These conversations reinforced the importance of designing professional learning that is responsive rather than prescriptive. Regional teachers are deeply reflective practitioners who benefit most from learning experiences that acknowledge their expertise and invite genuine dialogue. The feedback gathered throughout the tour will play a critical role in shaping future programs, ensuring they continue to meet the evolving needs of regional educators.

WHAT TEACHERS TOLD US

Teachers valued the focus on practice, the respect for professional expertise, and the emphasis on learning rather than compliance.

Comments included:

'Di Siemon for Education Minister.'

'Excellent resources and ideas.'

'Great to hear a non-government focus on learning.'

'Please come back again and again to the regions.'

Key takeaways shared by participants included:

The importance of using a range of teaching strategies responsive to students

- Renewed focus on big ideas when planning and teaching
- Avoiding unnecessary complexity in lesson design
- Regularly adapting practice to meet class needs
- Reflecting on current beliefs about how mathematics is taught and learned

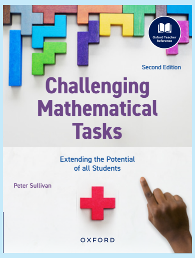
CONTINUING THE CONVERSATION

The Regional Tour is one of the many ways MAV supports teachers across Victoria. Thanks to Erin Holding (Eaglehawk North Primary School), Michelle Hibbert (Victorian Teaching and Leadership in Moe), and Monique Osborn (Moe Primary School) for generously hosting this year's events.

If you are interested in hosting a Regional Tour event, please contact dliddell@mav.vic.edu.au.

BOOK REVIEW

Di Liddell, Education Manager, MAV



CHALLENGING MATHEMATICAL TASKS (NEW EDITION)

Peter Sullivan's revised edition of *Challenging Mathematical Tasks* reaffirms his longstanding commitment to motivation, engagement, and deep mathematical learning. At the heart of the book is a clear and compelling ethos: students learn mathematics best when they are invited to work on problems they do not yet know how to solve. Rather than reducing challenge, Peter embraces it as a catalyst for thinking, sense-making, and genuine understanding.

A key strength of this new edition is the explicit application of contemporary learning design principles. Cognitive load is carefully managed through a clear and consistent approach to task design. Each task follows the same structure and layout, supporting both teachers and students to focus their attention on the mathematics rather than on interpreting instructions.

This consistency also enables routines to be established in classrooms, helping students build confidence and persistence when approaching unfamiliar problems.

The book also offers practical and flexible guidance on how tasks can be used to support retrieval and spaced practice. Sullivan acknowledges teachers' professional judgment by suggesting tasks may be introduced during a teaching sequence, revisited later for consolidation, or repurposed as revision opportunities. This flexibility makes the tasks well suited to contemporary curriculum planning, where revisiting and strengthening connections over time is critical for durable learning.

Metacognition and self-regulation are strongly promoted throughout the text. The challenging nature of the tasks demands concentration, sustained effort, and reflection. Students are encouraged to build connections between concepts, explain their reasoning, and transfer their learning to new contexts. In doing so, the book supports the development of learners who are not only mathematically capable, but also strategic and reflective in their approach to problem solving.

This revised edition provides valuable support for teachers seeking to design mathematical programs that promote effective, engaging, and intellectually demanding learning. By combining principled task design with practical classroom guidance, Peter Sullivan offers a resource that is both theoretically grounded and immediately usable, making it highly relevant for educators committed to improving mathematical outcomes through challenge and thoughtful pedagogy.

To learn more about the contemporary learning design principles that underpin this new edition, join our webinar with Peter Sullivan. Peter will unpack these principles in detail and provide practical guidance on how teachers can effectively use this resource in their classroom practice.

Register at www.mav.vic.edu.au.

MAVSHOP

WWW.MAV.VIC.EDU.AU/MAV-SHOP

MAV MEMBERS GET A DISCOUNT ON ALL STOCK

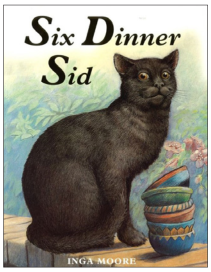
MAV 2026 TRIAL EXAMS

VCE

Prepare effectively for VCE Mathematics Examinations with the MAV Trial exams for Foundation Mathematics, Mathematical Methods, General Mathematics and Specialist Mathematics studies.

Each Trial Exam features: Original questions, highly relevant to the current course, fully worked solutions for all sections and clear marking schemes. Exam formats are similar to those used by the VCAA. Written in line with adjusted 2025 study design. Permission for the purchasing institution to reproduce copies for its students.

ALL STUDIES	$712 (MEMBER) $890 (NON MEMBER)
FOUNDATION	$140 (MEMBER) $175 (NON MEMBER)
GENERAL, METHODS, SPECIALIST	$272 (MEMBER) $340 (NON MEMBER)

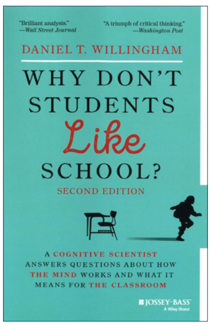


SIX DINNER SID

EC -2

Sid is a cat who is addicted to having six meals a day and glories in this lifestyle. Manipulative, persuasive and a charmer he has wrapped everybody round his little paw – each owner believes that Sid belongs to them only...until the day he is found out!

$14.60 (MEMBER)
$18.25 (NON MEMBER)

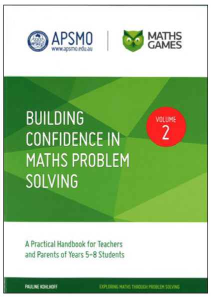


WHY DON'T STUDENTS LIKE SCHOOL?

ALL

The book helps teachers improve their practice by explaining how they and their students think and learn and reveals the importance of story, emotion, memory, context, and routine in building knowledge and creating lasting learning experiences. It is a valuable resource for both veteran and novice teachers, teachers-in-training, principals, administrators, and staff development professionals .

$35.90 (MEMBER)
$44.90 (NON MEMBER)



BUILDING CONFIDENCE IN MATHS PROBLEM SOLVING VOLUME 2

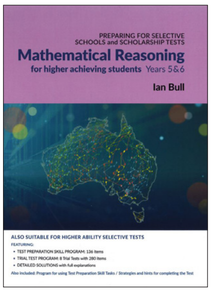
5–8

APSMO originally developed the Maths Games program in 2015. The program's aim is to provide interesting and challenging problem-solving opportunities for a wider range of students in a non-competitive environment. *Building Confidence in Maths Problem Solving Volume 2*, contains more problems and solutions drawn from their Maths Games program with an even wider range of difficulty levels.

The book is sequenced by difficulty and gradually progresses to a more challenging level with beautifully presented and illustrated solutions that showcase the application of various problem solving strategies.

The problems are indexed and colour coded according to the problem solving strategy used, allowing teachers and students to apply their previous learning of methods such as: Guess, check and refine; draw a diagram; find a pattern; build a table; work backwards; make an organised list; solve a simpler, related problem; eliminate all but one possibility; convert to a more convenient shape; divide a complex shape.

$46.80 (MEMBER)
$58.50 (NON MEMBER)



MATHEMATICAL REASONING FOR HIGHER ACHIEVING STUDENTS

5 -6

Preparing for Selective Schools and Scholarship Tests: Mathematical Reasoning for Higher Achieving Students Years 5 and 6 provides a thorough extension test preparation program based on the full set of mathematical skills required for the test. (136 questions across seven topics). This resource is appropriate for all states and territories in Australia. There are 8 trial tests (280 questions) with questions to be solved using higher order thinking with fully worked solutions.

$30 (MEMBER)
$37.50 (NON MEMBER)

THE MATHEMATICAL ASSOCIATION OF VICTORIA

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OR CALL +61 3 9380 2399

Prices are subject to change.