**Michael MacNeill** - Thank you folks for signing in tonight. Welcome to this webinar on the implementation of the VCE General Mathematics from the 2023 to 2027 study design. My name's Michael MacNeill. I am the Curriculum Manager for F to 12 Mathematics at the VCAA and my co presenter tonight is Kevin McMenamin. And we'll start with the acknowledgement of country. I would like to acknowledge the traditional custodians of the many lands across Victoria on which each of you are living, learning and working from today. From myself and those of us in the Melbourne Metropolitan Area, we acknowledge the traditional custodians of the Kulin Nations. When acknowledging country, we recognize Aboriginal and Torres Strait Islander people's spiritual and cultural connection to country and acknowledge their continued care of the lands and waterways over generations, while celebrating the continuation of a living culture that has a unique role in this region. I would like to pay my respects to elders past, present, and emerging, for they hold the memories, traditions, culture, and hopes of all Aboriginal and Strait Islander peoples across the nation and hope they will walk with us on our journey.

So, before we begin tonight, if you would like to look to the bottom of your screen, you should see a Q & A button. There is going to be an opportunity for me to answer some of the frequently asked questions around the subject and the revisions to the study design at the end of the presentation. However, if you think of something during the presentation, please enter it into the Q & A section and ensure that you've got all panellists selected so that all the panellists can see the questions. We will endeavour to answer as many of your questions as possible during the webinar. However, if time works against us, then I'll provide my details so that you can get in contact with me. And I'm happy to answer any questions after the fact. I just have to turn a light on again. There we go.

Okay, so the general outline of the webinars, this is the last of four of the Mathematics webinars. They all follow the same format, which is to outline the structural changes that have developed through the revisions to the study design and outlining the details of those study design revisions, outlining the framework for the assessment, and then also discuss how teachers can engage with the assessments across units one, two, three, and four. Any questions that have been submitted through the Qualtrics survey will be addressed, some of them anyway, as time permits during the Q & A time. Our timeframe tonight is from four o'clock till 4:45. And we'll aim to stick closely to that timeframe.

The study design for Mathematics for 2023 to 2027 is the result of a thorough consultation and review process. The VCE studies have been benchmarked against international standards after a wide consultation across government, Catholic and independent sectors, as well as stakeholders from the tertiary sector. It has been VRQA accredited from 2023 until 2027, making it our study design for the next five years. The main high-level revisions were to Specialist Mathematics and also to Foundation Mathematics, for which a new study has been developed for units three and four.

The role of the VCAA beyond this curriculum restructure will be to provide support for schools in understanding their responsibilities around the revised study design requirements and awareness of where their practice may need to evolve. The revised study design refers in the preambles for each of unit one, unit two and unit three and four, to the notion of assumed knowledge. And I'll talk to that for a little bit. This provides students with a good indication of the skills and knowledge from the subject that will facilitate their learning across the sequences. To clarify the notion of prerequisite subjects, particularly for 2023, General Mathematics unit three does not require units one and two. However, a lens of common sense really should be applied when counselling students on their subject choices.

Students may choose to transition into General Mathematics three and four from a previous VET or VCAL numeracy, or from units one and two, Mathematical Methods. However, schools must be aware that some extra work may be needed to assist students in establishing the appropriate background level of familiarity and orienting them with the course content. Confusion sometimes arises in the Mathematics studies around the distinction between what is considered examinable and what is considered an essential conceptual basis for learning and the development of key knowledge and key skills within the parameters defined through the areas of study within each of the subjects. Not all elements for learning in units, one, two, three, and four may appear on exam papers. The examinations for units three and four are constructed around the key knowledge and key skills listed under units three and four for the particular study.

And in Mathematics, the key knowledge and key skills find contextualization through the areas of study as listed again in the study design. General Mathematics unit one, consists of the following four areas of study. And units one and two for General Mathematics cater to a range of student interests. They provide preparation for the study of VCE General Mathematics at units three and four level and contain assumed knowledge and skills for these units. The areas of study for unit one and two of General Mathematics across both units are data analysis, probability and statistics, algebra, number and structure, functions, relations, and graphs, discrete mathematics, and space and measurement. Which is a small reshuffling or rewording, re-badging, of the areas of study.

And in undertaking these units, students are expected to be able to apply techniques, routines, and processes involving rational and real arithmetic, sets, lists, tables, and matrices, diagrams and geometric constructions, algorithms, algebraic manipulation, recurrence relations, equations and graphs, with and without the use of technology. They should have facility with relevant mental and by hand approaches to estimation and computation. And the use of numerical graphical, geometric, symbolic, financial, and statistical functionality of technology for teaching and learning mathematics, for working mathematically in related assessment is to be incorporated throughout each unit as applicable.

And for unit two, these are the particular areas of study. You'll note that space and measurement has changed, particularly the use of the word space rather than geometry. So, we'll get to the revisions for General Mathematics at this stage. Some of them are listed in, I'm not going to read out the full study design dot points, I'd encourage you to download your own copy of the study design. I will, however, refer to the particular dot points from the study design, and the PowerPoint for this particular presentation will be available on the VCAA website. They'll be referenced in the captions as well. So, for unit one in area of study one, dot points, one, two, three, and six, see a revision. So, the types of data now include interval and ratio for numerical data. The display and description of categorical data distributions will now be of one or more groups. And for the display and description of numerical data distributions, histograms, stem plots, dot plots, and choosing between plots, and here's the revised component, is according to context and purpose.

There's also now consideration of a range of distributions, symmetrical/asymmetrical, there's summary statistics, and the percentage of data lying within several standard deviations of the mean. We should also note that the Fibonacci sequence has been moved out of the study and into unit one of Specialist Maths now, it's no longer in the study for General Mathematics.

And the subtopic of arithmetic sequences, first order linear recurrence relations and financial mathematics, has been rewritten to more explicitly highlight the concepts. There's more of an emphasis on tabular and graphical display and sequences, and specific forms for the first order linear recurrence relations have now been specified in the study design. Dot points three to six, also expand and consolidate the ideas present in the current iteration of the study design, as well as highlighting the applications, particularly to finance. Excellent, thank you. The revisions now to unit one, area of study three, dot points one to four, where we are looking at particularly linear functions. And these dot points have been rewritten and combined to describe in a more focused fashion, linear relations in terms of the scope, exploration and applications.

The unit one area of study four, dot points, one to four. Most of the areas of this area of study remains the same with the addition of one more dot point. And that is the introduction to transition matrices, assuming the next state only relies on the current state, working with iterations of simple models, linked to for example, population growth and decay, including informal consideration of long run trends and steady state. Moving on to unit two now. We see some modification as well as some revision.

So, from the first area of study for unit two, The obvious change is the obvious absence being of the Pearson correlation coefficient and the least squares line. And these have been replaced with a "line of good fit". From area of study two in the key knowledge and key skills, the specification of Prim's algorithm has been revised to a broader definition of greedy algorithms. And construct graphs, diagraphs, networks, and their matrix equivalents to model and analyse practical situations is a dot point that was previously in units three and four. The revision to area of study three for unit two, there's been some modification or clarification around the transformations to linearity. Modelling of data now is only y = k/x, it's no longer y = + c.

And from area of study four, applications for Pythagoras theorem, there's no real operational change, there's a bit of a rewording, to incorporate some broader definitions. Arcs and sectors for circles have been written into the study design, the formula written in the key knowledge. And the area of triangles no longer appears in the areas of study, but it remains in the key knowledge component for that particular area of study. And this slide was provided as a summary for those elements, which have been rewritten, removed or deleted.

And we'll move on to unit three and four now. So, the study has been renamed. That's probably the front and foremost revision that has occurred. This helps to establish a clearer sequencing across all four of the Mathematics. We have Foundation, one to four, General Mathematics, one to four, Maths Methods, one to four, and Specialist Maths, one to four. There are now two areas of study, and the subject is fully prescribed, there are no modules.

And that may need some clarification where students might be using a previous edition of a textbook and may decide to exercise some autonomy with their selection of modules. They may need to be reminded that there are no modules anymore. It is only going to be matrices and networks and decision making as part of the prescription for areas of study, area of study two. General Mathematics, unit three and four, focus on real life applications in mathematics and consist of the areas of study of data analysis, probability and statistics and discrete mathematics. Unit three comprises data analysis and recursion and financial modelling. And unit four comprises matrices and networks and decision making, decision mathematics, sorry.

The assumed knowledge and skills for General Mathematics three and four are contained in General Mathematics units one and two, and will be drawn on, as applicable, in the development of related content from the areas of study, key knowledge and key skills for the outcomes of General Mathematics three and four. And in undertaking these units, students are expected to be able to apply techniques, routines, and processes involving rational and real arithmetic, sets, lists, tables, and matrices, diagrams, networks, algorithms, algebraic manipulation, recurrence relations, equations and graphs.

And again, they should have facility with relevant mental, and by hand approaches to estimation and computation, and the use of numerical, graphical, geometric, symbolic, statistical, and financial functionality of technology for teaching and learning mathematics, for working mathematically, and related assessment is to be incorporated throughout each unit as applicable. Next slide, please, Kevin. Here we can see a comparison of the two structures, I say previous year, but that's in 2022, or finishing this year. Where there's the core component and then the modules where we've got data analysis and recursion and financial modelling, and how those elements of the current study design, in 2022, are going to be redistributed across the two areas of study that are present in the 2023 to 2027 study design.

There's a lot of similarity which will prove to be quite comforting, I think, to teachers, yourselves, as we map the new study out to the students, I do, however, again, call for awareness that geometry and measurement, which is currently module three, and graphs and relations, module four, no longer form part of the study design for 2023 to 2027. It will only be the previous modules, one, matrices, and module two, networks and decision mathematics that remain present in the 2023 to 2027 study design. And there have been some revisions to those as well. Next slide please, Kevin.

General Mathematics units three and four continues to have students investigating data types, data representations, and seeking to draw meaning from data representations, both tabular and graphical. Much of how this area of study has previously been taught or learned will map untransformed from the current iteration of the study design to the 2023 to 2027 iteration. The notion of reviewing data types and representations has been removed and a broader reading of the revised study design will reveal the review dot points have been removed from all of the unit three and four sequences in the Mathematics studies.

That said, the extent to which your particular cohort or class groups within that cohort, may require some level of revision will vary distinctly across schools, and even within cohorts themselves Area of study two encompasses notions and applications of recursion to finance, as well as the previous modules of matrices and networks and decision making. The obvious revisions include the explicit mention of the TVM Solver, the use of technology and the algebraic form for the first order linear recurrence relations. Also, of note in these sections on depreciating assets, compound interest, reducing balanced loans, annuities and perpetuities and compound interest, is that the restriction for n being less than or equal to five has been revised to reflect from first principles only. And the intended effect was not to have students complete a recursion for large values of n, necessarily, but to expand the sequence potentially past n equals five and make observations about the sequence behaviour.

Again, however, there is significant congruence between the current iteration of the study design and the 2023 to 2027 iteration. There are two obvious alterations for the matrices topic for 2023 to 2027 study design from the current study design. And that is, excuse me, the utilization of matrices for the purpose of solving systems of simultaneous equations is no longer present in either the areas of study, key knowledge, or the key skills dot points. And secondly, the introduction of the Leslie matrix as a form of transition matrix to the areas of study. It's not mentioned in the key knowledge or key skills, and the specific application of the Leslie matrix will be to populations. I'll talk about that briefly in a moment or two.

The networks and decision-making mathematics topic bears a near facsimile resemblance to the current module, with wording modulated rather than deleted. All of the areas are study dot points that appear in the current iteration of the study design do continue to appear in the 2023 to 2027 study design. Prim's algorithm appears explicitly now in the key knowledge as well. The introduction of the Leslie matrix has led to some questions being raised either in the frequently asked questions or as an enquiry that I've received over time. So, I'll address that to an extent now.

The introduction of the Leslie matrix as a form of transition matrix to the areas of study, not in the key knowledge or skills was for the specific application to populations. It appears in two of the dot points three areas of study two, which is the use of the recurrence relation for where S naught equals the initial state matrix, SN+1 equals T times SN, or SN+1 equals L times SN, where T is the transition matrix, L is the Leslie matrix, and SN is a column state matrix to generate a sequence of state matrices. It appears in the, or the relevant key knowledge dot point is that the inverse of matrix and the condition for the matrix to have an inverse, including determinant for transition matrices assuming the next state only relies on the current state with a fixed population.

And back to area two, sorry, area of study two dot points, there is a dot point that refers to an insect population, comprising eggs, juveniles, and adults. Which importantly provide components for a complete population, but during segmented time components of that population's evolution. The outcome one key skills dot points are all four of them can be referred in some way to the Leslie matrix. I won't read those out, they are in the study design. It is important to note that in the context of General Mathematics, we are not seeking to have students learn to solve eigenvalue value or eigenvector problems or conclusions that must necessarily be drawn through the identification of dominant eigenvalues or the absence of a dominant eigenvalue, leading to population oscillations. Students should be aware of factors influencing the development of a Leslie matrix, however, including from a transition diagram, and the application to populations or population components.

However, operationally, the Leslie matrix will be a form of transition matrix. And in the support material, and this is again, one of the frequently asked questions, the support material, we have developed a great learning activity to illustrate this particular component.

Next slide, please, Kevin. From the data analysis, we can see no longer the notion of deep understanding around descriptive statistics is required for sampling. Oops. My light's turned out again, there we go. For sampling as well as deeper discussion seeking to explore correlation and causation. The utilization of first order linear recurrence relations sees some clarified specificity in the subtopic of depreciation of assets. Utilization of matrices for the purpose of solving systems of linear equations, importantly, no longer appears in the study. And I'll speak briefly to this. This is the revised structure for the School Assessed Coursework and not necessarily a revised structure. The percentages that contribute to the study score, present on the screen there.

However, we want to reaffirm any presumptions that might be there. The SAC work for unit three continues to be one application task, that's a guided investigation of a given set of data, with several variables that goes for four to six hours across one to two weeks. It used to consist of at three sections of increasing complexity, the construction description and interpretation of data plots, including smoothed plots where time series data is used, the calculation and interpretation of summary statistics, including seasonal indices and their application where time series data is used, and the modelling of linear associations or trends where time series data is used, including the use of data transformations as appropriate.

There's to be one modelling or problem-solving task that is related to recursion and financial modelling, that goes for two to three hours across the period of one week. And these two assessments for unit three, contribute 24% to the overall study score. For unit four, there are to be two modelling or problem-solving tasks or can be a combination of those two. The tasks are to be of two to three hours duration across one week. And one of the tasks must address matrices. And the other tasks must address networks and decision mathematics. These two assessments combined will contribute 16% to the overall study score.

The examinations again, see a great congruence to the current structure of the exams. Exam one will be multiple choice and cover all areas of study. There'll be no modules, of course. And the exam is designed to assess students' knowledge of mathematical concepts, models, and techniques, and their ability to reason, interpret, and apply this knowledge in a range of contexts. Exam two will comprise written response questions, covering all areas of study. The examination will be designed to assess student's ability to select and apply mathematical facts, concepts, models, and techniques to solve extended application problems in a range of contexts.

The exams are both going to have a duration of one and a half hours. Student access to an approved technology with a numerical, graphical, symbolic, financial and statistical functionality will be assumed. One bound reference continues to be a permitted item. It may be annotated, maybe a lecture pad, and that may be brought into the exam. The dates will be published annually by the VCAA, and marking will continue to be done by a panel of assessors appointed by the VCAA, the rules per usual will be published annually in the VCE and VCAL administrative handbook. And I'll pass over now to my co-presenter Kevin, who will have a talk about the investigations in unit one and two, and the assessment structures at unit three and four.

**Kevin McMenamin** - Thank you, Michael, and welcome everybody to this webinar this afternoon. The investigations that we're going to refer to are new to the unit one and two level. They do mirror in some respects, the SAC tasks that are generally written and presented at the unit three and four level. The purpose of these tasks is to introduce them a year earlier than would normally be seen, thus giving the students some idea of the nature of these tasks. They certainly can be a little bit smaller in terms of the work that students are expected to do, but they do come under the banner of similar sorts of tasks that would then be in line with the teaching and learning that takes place in both units one and two.

As the slide indicates, they are meant to be done over one to two weeks. There is no specific time allocated to these. Michael just referred earlier to specific times that should be spent on application tasks and the modelling or problem solving. These are just tasks that you are going to set up, the two weeks may in fact be a few lessons that are built around a weekend. So, it goes towards the end of one week into the second week. It's not meant to be two weeks specifically. How you run them should be in the context of the teaching and learning that's taking place within your classroom and directly linked to the key knowledge and key skills that may be either studied in the current topic, or maybe over the last two topics, where you start to create these investigations.

In terms of the concepts and skills that you're going to bring in, it could be an assessable item that you're going to use it for. Generally speaking, it probably will be an assessable item. And again, possibly on a rubric where you're going to assess this, might be something that you might look into. And we'll talk about that a little bit later, as we go through these slides. The investigations are going to fall under three particular headers, formulation, exploration, and communication. The purpose of the three, again, mirror in fact, what the SAC tasks do at the three/four level. The formulation of the question, what it's going to look like, maybe some research that needs to be undertaken, things that might be developed. And of course, you, as the facilitator of these particular subjects may provide some structuring, some scaffolding in terms of what's needing to be looked for.

The main idea with most of these is to come up with some sort of a topic that might be useful in this investigation. It could be in terms of the key knowledge and key skills, a particular task that develops those key knowledge and key skills directly, rather than you introducing them into the classroom itself. It could be the exploration of an area of study, for example, data, where you are looking to see how that's implemented into the analysis or investigative style task, where the students are bringing all of the bits and pieces together.

The exploration is essentially the nuts and bolts of what's happening in the task itself. What are they looking to present? How are they looking to formulate a response? What's the mathematics that's going to be undertaken? What areas of study are being looked at? What content is being developed? How are they analysing any of the results that come out? What investigations are being undertaken? How much development in solutions is there? How much variety? So that exploration would take up the bulk of the time.

The communication component of course is open, depending on how you want the students to present this. It could be via a written response. It might be in a PowerPoint display. It could be the student actually talking to the response itself. It might be an oral presentation, could be in groups. If you've got a grouped item there that students can work on, and don't underestimate the power of group working, particularly at the one/two level where students might have the opportunity to develop some ideas of learning together, and then be able to formulate these into some sort of an investigation as they go through.

So, these three items you'll see here, the formulation, exploration, communication, form a great basis to write any sort of an activity. It does set up the structure of openness and exploration, which is one of the key elements of the investigations and also the SAC tasks that they would undertake at the three/four level. The implementation of the investigation itself certainly can be via a learning activity, as it stated before. It could be to investigate some component of content or key knowledge and key skills. I know there's a space and measurement component within the unit two area specifically.

You might wish to set up some scenarios where students can start to develop learning in that particular area. Maybe it's the development of a land package or a land parcel, where you're going to look at the fitting of a development on that particular parcel of land, maybe the construction of roads or community ideas, where you set these sorts of things up. The learning activity, as I said, can look into the work that's going to be introduced. If you wanted to assess items that have already been taught, that's also okay. As it indicated before, the idea of data being investigated or finance, as we would normally do at the three/four level, could be a combination of particular areas as well.

So how you wish to integrate this into your learning of course, will depend on the cohort of students that you are working with, the period of time of the year when you are looking to do this, and then to integrate it in. The courses have certainly been set up to allow this investigation to take place and to be built into both semesters one and two, knowing that the courses themselves are really based on a nine-week term, so an 18-week semester. So, there is development and awareness of these investigations coming in. The activities themselves would be the next part of trying to construct or structure these. If you can develop them from the learning and teaching, then that's a wonderful use of the skills that the students have actually learned. To come up with one, I would probably suggest you think about some of them now.

Being able to work from day to day, you'll see many opportunities for mathematical learning to take place under an investigation type task and even a SAC task as well. And part of the writing of these is trying to come up with the appropriate topic or story that you are wishing to tell. As part of this structure, computational thinking will inherently become part of the work that the students will, in fact, undertake. The computational thinking doesn't necessarily have to be a physical mathematical work, step by step, it can be a set of items that are showing that there's a link between a research that was undertaken, the data or information that was found, how that was then pursued in terms of an exploration, what was done to unpack that material. What was then looked at as an analysis, and then the idea of communication. There's computational thinking already going on in trying to set up that scenario.

So, it can be a little bit broader than just a set of mathematical steps to go and get some sort of a solution throughout. We've already talked about the idea of the assessment. It can actually be used for that. And we've certainly highlighted the idea of it being preparation for the three and four level. Just to give you a brief idea of what a task might look like. And there are many examples in the support material that will be published later on this year. And Michael will refer to that in a little bit more detail later on. But the idea of coming up with a topic, this one's planning and costing for a day trip. So, the planning phase could in fact bring in the space and measurement where you are looking for a particular route or exploration of an area of Victoria or the city or somewhere else.

So there certainly can be space and measurement brought into it. The idea of the costing could certainly then bring in the finance component of the course, where they're going to visit, what's going to be visited, how they're going to get there, the use of public transport, all of those sorts of ideas would then encourage the student to certainly do some research, grab some data. The data they might go, and grab could then be used in the data element of the course. The exploration part would then be trying to work out the costs, trying to form some sort of an itinerary, maybe a total cost for the day, where costs are going to be incurred. Anything that looks for delays or anything else along the way. And then how that might be communicated at the end.

Of course, what's being presented here is a fairly broad set of topic items. And this is generally where the ideas begin. Your scaffolding would then come in to allow students to get into the question and explore in some sort of a detailed item. But to leave elements open is also a key feature of these sorts of tasks that you're going to set up. Or giving the student opportunity to develop ideas themselves is part of the notion of these tasks. And certainly, is something that's fostered more closely in the three and four level. And talking of the three and four level, just looking at the outcomes that come up for the Application tasks. That's what they look like as a written format, but in terms of allocating them to the task, and this certainly is written in detail in the study design, the Application tasks require you to grab some data, for example, with the data analysis component and then analyse it.

So, it might be the development of a graphical idea at the beginning, say a time series. You might look at the regression components that are obvious or allowed to foster some understanding of the data that's there. It could then develop into transformations of that data, how it might then be used to project ideas further on, if it's the time series, the idea of interpolation, extrapolation, how it might be developed in terms of seasonalizing or de-seasonalizing.

So, the scope of the task can become quite broad, but the whole notion is to make them open. The tasks themselves should be in more breadth and depth than an examination question could possibly start to explore and utilize all of those skills that the students have picked up on their way through. To give you just an example of a unit three and four, SAC task. This could be the beginning of one. In fact, the website contains a whole series of wonderful SAC ideas. There's a set of videos there as well to try and encourage you to develop these and processes for development. Many have found in writing these, they're not as onerous as once was where you're trying to come up with a minute per question. You do try and build in some planning time and some preparation time for students in these particular tasks so that they do have the opportunity to think, to play, and to explore at the same time.

The use of a rubric has become certainly more common to assess these particular tasks as students work through them. And you are trying to essentially get an understanding from the students based on their work that's there. The website of the VCE has many great rubrics that can be used. And certainly, there's a standard one there that usually has three items for outcome one, three for outcome two, and then two for outcome three, but each of them explores the presentation and material, the notations that's used, the content that's being developed, the analysis that's taking place, the accuracy of your answers, what sort of limitations or conditions that have been placed on the investigation itself, and then the technology use at the same time.

So, these are very similar to previous, really the change that you'll be needing to implement as part of your structure, even this year would be a great opportunity, is to start to develop that notion of an investigation at the one/two level, and then use it to develop it into the three/four level. So that just gives you a broad overview of the investigations in one/two, and the analysis, or, sorry, the problem solving, modelling and investigation tasks at three/four. And then I will hand back to Michael to carry on with the computational thinking.

**Michael MacNeill** - And I'll unmute myself. Okay, thank you, Kevin. Now the notion of computational thinking and algorithmic thinking has been, well, algorithmic thinking in particular, has been a part of the F - 10 curriculum for some time now and has been alluded to in the previous iterations of the study design. And it is something which I think many teachers have been doing. They've just, perhaps haven't been calling it algorithmic thinking. And I think there's a great comfort in that. Algorithmic thinking is really the development of a procedural mindset. And computational thinking can be applied in more complicated situations, where there might be something like say, a story style question, an exam might be a very straightforward example, it's not the best example, but it's a straightforward one, where students need to decompose what the information is and make it simpler.

There needs to be an identification of patterns and abstraction to identify any variables that might be present. And then the application of an algorithm, that's that procedural set of steps that I was previously alluding to. Now, I don't think it's actionable from here directly, but when the presentation goes up on the website, then the links will be active to pages on the VCAA website, which go into greater detail about what computational thinking is and how it might be employed.

Kevin, we might move to the frequently asked questions now, and I want to want to address these and hopefully get to some of the questions which have cropped up. I see that there are some in the question-and-answer section. I want to acknowledge that they're there and I'll be able to get to as many of those as I can within the timeframe that we've got.

So, these frequently asked questions, I selected on the basis of the frequency with which they were asked. So, support material is a pretty consistent one. Yes, support material is in the process of being developed and quality assured. It will be published on the VCAA website across the course of the second half of this year. We will also have sample examination questions, which are going to be also published, hopefully by the end of this year, and certainly well in advance of next year, so that you will have a good understanding of what any revised questioning types will look like.

Sample SACS continue to not be published by the VCAA. However, I will say that in the support material, there are plenty of what I think of as SAC starters or investigation starters. And Kevin alluded to those earlier. The trickiest part of developing a SAC continues to be the creativity and determining the application of the particular mathematics within a particular context.

And we're hoping that the support material will go a long way towards addressing that element of the required creativity without prescribing a particular SAC in depth, to the point where authentication becomes an issue, which is why we historically have not published SACs on the website.

I'm addressing this, the question about pseudo code, because that has also cropped up, Pseudocode is a new element of the course only for Mathematical Methods and Specialist Mathematics. It is not a component of the General Mathematics or the Foundation Mathematics course, and as such will not be examinable, nor will it necessarily form a component of teaching for the General Mathematics course. That's not to say that if you have a particular student for whom pseudocode would be a good learning vector, then you should avoid it completely, however, just be aware that it is not something that we're seeking to examine in unit three and four of General Mathematics.

The SAC structure, we've been through that just previously, and a brief recap is that there is an application task and a modelling or problem-solving task in unit three. And then in unit four, there'll be either two problem solving tasks, two modelling tasks, or a combination of the two. One of those needs to be on matrices. And the other unit four needs to be on networks and problem, sorry, networks and decision making. I've just been through the role of computational thinking for the subject and the application for it.

I might try to address some of the questions listed in the Question-and-Answer section here today. Samples of an investigation, and what should they look like, and how detailed? That will be coming out in the support material. I'm hopeful that will be coming out in the very near future, but certainly across the course of the second half of this year.

Probability, the re-badging of the areas of study to include probability in the title, was really to provide an umbrella topic across the four mathematics. We kind of anticipated, or it was an anticipated question that this would be raised, but there would be no more probability in the 2023 to 2027 course than there would be in the current iteration of the study design.

There's a question here about unit one and two being introduced next year. The units one, two, three, and four for Mathematics will be implemented in one shot in 2023. This is also spoken about in the preamble of the study design before any of the subjects. There's an introductory section where that is discussed. But it will be units one, two, three, and four introduced next year. So, there'll be no Further Maths in 2023, it'll just be called General Maths. And it will be a sequence for one, two, three, and four.

There's a question about textbooks. I don't speak for the publishers, but the textbooks will be publishing, I'm sure across the course of the remainder of this year and early next year. Sample rubrics are available, as Kevin has discussed previously, on the website, and lost my spot there, and can be modified and utilized for assessment within your own context. Just becoming conscious of time here, I'll try to encompass a few of these questions.

There's a lot of questions that ask about examples and SACs and investigations. There is a lot in the support material. There's learning activities, there are sample investigations, there are sample SACs, starting points for SACs. They are going to be a part of the support material, and that will be coming out in the course of the second half of the year. The support material would be available on the VCAA study pages study design pages.

We've reached 4:50, which is five minutes past our projected timeframe. So, we might need to end the session here. I want to acknowledge the fact that teachers such as yourselves are demonstrating an enormous level of resilience across the course of this year. I want to acknowledge that, I want to offer my appreciation for the work that you do in presenting the courses to the students, and the fact that you've come out here at the end of a teaching day to listen to these clarifications, is testimony to the diligence that you demonstrate in that duty of care to the students. And I want to thank you for that.

The questions that I haven't been able to get to, and can't get to right now, you'll see my details for contact on the screen. They are also available on any of the study design pages for any of the four Mathematics. I'm happy to field phone calls or emails with regards to any of the questions that you might have here, that we haven't been able to get to today.

Again, I thank you for your attendance and wish you well for the remainder of the year. Thank you again.

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