**Erin Wilson:** - Hello, and welcome to the first of a series of videos to introduce and support the implementation of the reaccredited VCE Biology study design 2022 to 2026. My name is Erin Wilson and I'm the curriculum manager for STEM at the Victorian Curriculum Assessment Authority, or VCAA.

Firstly, I would like to acknowledge the traditional custodians of the many lands across Victoria on which each of you are living, learning and working. For myself, I acknowledge the Dja Dja Wurrung as the traditional custodians of the land from which I am presenting today. 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 Torres Strait Islander peoples across the nation. I would like to also acknowledge their continued care of the lands and waterways over generations, and the ongoing contribution they make to our scientific thinking and understanding of the discipline of biology.

The purpose of this video is to outline the new features of the VCE Biology 2022 to 2026 study design, provide an overview of the new units and assessment structure, provide foundation knowledge of the specific unit one and two, and three and four videos that will be soon available, and to outline the resources that the VCAA will have available to support the delivery of VCE Biology in 2022.

In terms of resources for the VCE Biology 2022 to 2026 study design, both the VCE and VCAL administrative handbook and the study design are mandated, and these should be the first place that you go to for planning, and to find out answers to any questions that you may have. Whilst the study design is accredited from 2022 to 2026 it's important that schools and teachers refer to the VCE and VCAL Administrative Handbook for the year in which they are delivering VCE Biology. So, for 2022, schools and teachers should refer to and access the VCE and VCAL Administrative Handbook for 2022.

As well as the VCE and VCAL Administrative Handbook and VCE Biology study design, there will be a range of resources available later in December as part of a new and improved VCE Biology study page. This updated webpage will include a list and a range of support materials that incorporate the advice for teachers, including planning advice, teaching and learning activities and sample plans, and assessment advice, as well as implementation videos, FAQs, examination specifications, and a sample examination for the end of year examination that is conducted as part of units three and four of the revised study design.

Additionally, live Q&A webinars are planned for term one in 2022, focusing on teaching and learning in units one and two and units three and four, as well as advice relating to the delivery and audit of unit three school-assessed coursework. Details regarding these events will be conveyed via the VCAA bulletin and notice to schools.

The 2022 to 2026 VCE Biology study design is underpinned by the scope of the study, the rationale and the aims of the study. VCE Biology recognises that knowledge in biology has developed over time, and that this knowledge continues to change in response to new evidence and new discoveries. An important feature of the VCE Biology study design is the opportunity for students to engage with a range of scientific investigation methodologies, to develop key science skills, and to interrogate the links between knowledge, theory and practise, as outlined in the cross-study specifications. Spending time to understand the scope of the study, the rationale, or the way that VCE Biology has been structured, as well as the aims and cross-study specifications of VCE Biology, will allow teachers and students to maximise the learning outcomes when studying each unit.

Each unit includes specific content contained, it's an area of study and it's designed to achieve a set of outcomes for that unit. Each outcome is described in terms of key knowledge, which is complimented by relevant VCE Biology unit one to four key science skills that are included under the cross-study specifications at the front of the study design. For each outcome students are assessed in terms of satisfactory completion, as well as their level of achievement in either school-based tasks for unit one and two, or school-assessed coursework, SAC tasks, for units three and four.

It is also important that teachers take the time to understand the safety and wellbeing requirements of the study, as well as the requirements relating to the ethical conduct of scientific investigation and legislative requirements that are included on pages four and five of the study design. The cross-study specifications on pages seven to 14 in the 2022 to 2026 VCE Biology study design have been expanded to include a focus on key science skills, scientific investigation, critical and creative thinking, ethical understanding, individual and collaborative scientific endeavour, and Aboriginal and Torres Strait Islander culture knowledge and history.

It is important that teachers take the time to understand these cross-study specifications, and consider how they will support each one of these when selecting teaching and learning activities as part of the curriculum and assessment programme they develop for the VCE Biology study design 2022 to 2026. The key science skills are a core component of the study of VCE Biology, and apply across units one to four in all areas of study. In designing, teaching and learning programmes for each unit and in assessing student learning for each outcome, teachers should ensure that students are given the opportunity to develop, use and demonstrate these key skills in a variety of contexts, including when undertaking their own investigations and when evaluating the research and investigations of others.

It is important that teachers explicitly identify the relevant key science skills that they will be explicitly supporting students to develop, practise and be assessed against for each outcome, as well as providing multiple opportunities to practise and apply each specific unit one to four key science skill that have been contextualised specifically for VCE Biology. Whilst there are similarities in the key science skills between the 2016 to 2021 study design, and the 2022 to 2026 VCE Biology study design. In relation to the key science skills that apply across all VCE Sciences, there are some changes that teachers should ensure that they are familiar with, and consider how they will accommodate these changes in their new and updated curriculum and assessment programmes.

Specific changes include plan and conduct investigations, generate, collect and record data, analyse and evaluate data and investigation methods, construct evidence-based arguments and draw conclusions, analyse, evaluate and communicate scientific ideas. Across units one to four there are opportunities for students to engage with teacher-facilitated, student-adapted and student-designed scientific investigations. The principles of fair testing through controlled experiments are an important aspect of VCE Biology, but they may not always enable students to understand scientific ideas or concepts, answer their questions or appreciate how biologists work in the nature of science.

For this reason a range of scientific investigation methodologies are included in the 2022 to 2026 VCE Biology study design. Common to these different scientific investigation methodologies, and practical activities that include these scientific investigation methodologies, are three key aspects that are central to the study design's inquiry focus, asking questions, testing ideas and using evidence. Teachers should therefore ensure that they include a range of scientific investigation methodologies and practical activities in their teaching and learning programmes across units one to four.

The scientific investigation methodologies and practical activities that are selected in any area of study will depend on the research questions being explored and/or the key knowledge and key science skills that are being covered. Further advice regarding scientific investigations, scientific investigation methodologies will be available as part of the new VCE Biology study page, under support materials.

Practical work is a central component of learning assessment in VCE Biology across units one to four. Practical activities may be used to introduce and consolidate, understanding of a biological concept, to develop or practise scientific skills. Practical activities may also be used to develop assessment tasks, such as the production of a scientific report or poster-based on log book records. Reflective annotations from a log book of practical activities and the analysis of data and results, including appropriate graphical representations formulation of generalisations and conclusions where appropriate. in the context of VCE Biology a practical activity really refers to any teaching and learning activity, which at some point involves students observing or manipulating the objects, concepts, or materials that they are exploring. The observation or manipulation might take place in the school laboratory or classroom, but could also occur in out-of-school settings, such as in the student's home or in the field. Practical activities certainly are not limited to experiments, as this often relates to the testing of a prior hypothesis.

The VCE Biology study design does not specify the methodologies, methods or materials required to complete practical activities in each area of study, since each school is unique and has specific resourcing capacity, as well as resourcing capacity. Different methodologies may best suit the key knowledge and the selected relevant case science skills in each area of study that teachers choose. Teachers and schools should therefore use the flexibility afforded in the study design to decide when students will develop, use and demonstrate their understanding of each of the scientific investigation methodologies included in the VCE Biology 2022 to 2026 study design.

Simulations, remote experiments and virtual experiments can certainly be used as the basis for experiments where physical resources, for example, equipment, facilities or access to an appropriate site are not available. Students may also be provided with sample experimental data where physical resources are not available. And, really, schools can use any of the other remote and virtual strategies that they've been using over the course of the last 18 months, as a result of the COVID-19 pandemic, in the 2022 to 2026 study design. As a guide, teachers should ensure that there is at least one practical activity for each subheading of key knowledge in each area of study. We recognise that this, of course, will be influenced by many factors, which is why there is now the specification of a minimum of 10 hours across areas of study one and two for units one to four, rather than a specific number of hours for each area of study.

Whilst the maintenance of a log book is standard scientific practise in recording primary data, for the purposes of VCE Biology the use of log books has been extended to include note-taking by students, relating to the collection of secondary data, as well as other classroom activities that they may be engaged with to support teachers to authenticate and assess students' work. Presentation format of the log book is a school decision, there's no specific format that is prescribed. And so therefore log books will vary across units, across areas of study, and also may vary across schools. Data contained within a student's log book may be qualitative and/or quantitative, and may include the results of guided activities or investigations, planning notes for experiments, results of student-designed activities or investigations, personal reflections made during or at the conclusion of demonstrations, activities, simple observations made in short class activities, links to calculations or other student digital records, notes and other images taken on excursions, web based investigations and research, including online communication and results of simulations, surveys and interviews. Notes of any additional or supplementary work completed outside of class can also be included in a student's log book.

The terms used in this study section is a new inclusion in the revised VCE science study designs. Teachers should ensure that they understand the definitions of these terms as they are described, and apply to VCE Biology. Further information relating to the application of these terms will be available as part of the new VCE Biology study page under support materials. As well as the information relating to ethical understanding and ethical approaches and concepts that is provided within the VCE Biology study design 2022 to 2026, and the additional information that will be available as part of the support materials. Teachers may also like to refer to recently published resources that are now available on the VCAA website to support schools in teaching bioethics within the Victorian Curriculum F - 10. Level nine and 10 resources contain activities that focus on approaches to bioethics and ethical concepts that are also included in the VCE Biology.

So, these may be particularly pertinent for you as you begin your planning, and considering how you're going to support students in undertaking VCE Biology as an extension of F - 10. The resources can be accessed via the QR code included on the slide. In addition, as well as the information relating to the inclusion of Aboriginal and Torres Strait Islander knowledge, culture and histories that's provided in the study design, in particular, the link to the protocols that has developed, and that will also be available as part of the new VCE Biology study page and support materials. Teachers may also like to refer to the recording of webinars that were conducted in 2020 to provide teachers with support to make Aboriginal perspectives visible in the Victorian Curriculum F - 10. Again, these resources can be accessed via the included QR code.

Across units one to four each unit and area of study is structured using a series of curriculum framing questions to reflect the inquiry nature of science and the discipline of biology. Unit one looks at how organisms regulate their functions. Area of study one looks specifically at how cells function while area of study two looks at how plants and animal systems function. Students are then provided the opportunity in area of study 3 to undertake either a student adapted or student-design investigation, develop an understanding of how organisms regulate their functions.

In unit two students consider how inheritance impacts on diversity. In area of study one they consider how inheritance can be explained, and they look at how inherited adaptations impact on diversity in area of study two. Area of study three provides students the opportunity to consider how humans use science to explore and communicate contemporary bioethical issues that relate to inheritance, adaptations and/or diversity. In unit three students consider how cells maintain life, specifically, they consider what the role of nucleic acids and proteins in maintaining life is, in area of study one, and they extend this knowledge in terms of how biochemical processes, specifically, photosynthesis and cellular respiration are regulated in area of study two. In unit four they consider how life changes and responds to challenges, considering specifically how organisms respond to pathogens in area of study one. In area of study two they consider how species are related over time, and then in area of study three are provided the opportunity to design and undertake a scientific inquiry to investigate cellular processes and/or biological change.

Whilst the outcome of unit four outcome three is reported in VASS as part of unit four, student-designed scientific investigations can be undertaken in either unit three or unit four, or across both units three and four. It's important to note that the investigation must involve the generation of primary data relating to cellular processes and/or how life changes and responds to challenges. And also involves the assessment of individual students capacity to design a scientific investigation. As part of unit four outcome three, in the revised VCE Biology study design for 2022 to 2026, assessment will involve students log book, as well as the completion of the scientific poster.

When developing your school's curriculum and assessment programme for VCE Biology 2022 to 2026, it's important to remember that each school is different and that there are different contexts that schools and students operate in, 'cause over 500 schools deliver VCE Biology across the state of Victoria, and every single one of those will have different circumstances, different resources and different capabilities. Your students will have different strengths, different talents, different resources available to them than students in other schools. Therefore, it's important that the design of the curriculum and assessment programme for your school, in your cohort of students, reflects this and supports the effective assessment of the students in that particular year level. Schools are therefore encouraged to develop their own curriculum and assessment programme, a school-based assessment that meets the needs of the cohort of students and the context of which they are learning.

When developing a curriculum and assessment programme in related assessment tasks, it is critical that these meet the requirements of the study design and the VCE Assessment Principles, regardless the way that the programme is structured. Assessment is an integral part of teaching and learning at the senior secondary level, and it ensures that standards are maintained, it provides the basis of the award of a certificate, as well as measuring student achievement it also identifies opportunities for future learning.

The VCE Assessment Principles underpin all assessment at VCE, and in particular when developing assessment tasks that assess students' level of achievement, it's important that teachers ensure that these adhered to and represented in the assessment tasks designed. Assessment tasks need to be valid. They need to be equitable. They need to be balanced, and they need to be efficient. Careful consideration of the VCE Assessment Principles and the range of learning activities that will be used to provide appropriate opportunity for students to demonstrate satisfactory completion of the outcome, is an integral component of the VCE in terms of maintaining the integrity of VCE Assessment. The integrity of VCE Assessment is of paramount concern to schools, and as such teachers and schools need to develop and implement robust authentication strategies to ensure that students work submitted is clearly their own. We know that the most effective schools build a culture of integrity and trust, and that there is ongoing formative assessment to gather knowledge and evidence of student ability and satisfactory completion of the outcomes, as well as levels of achievement.

School-based assessment is the opportunity for schools and teachers to design teaching and learning activities for a specific cohort of students, with assessment that is personalised for them. So, central to school-based assessment is the understanding that teachers know their students, you know your students best, and that you also know the best ways to collect evidence from your students in terms of their level of achievement. For each outcome there is two forms of assessment, satisfactory completion of an outcome, S or N, as that relate to units one to four. And then also the opportunity for students to demonstrate their level of achievement relative to the outcome, and also their peers or cohort.

So that's school-based tasks in unit one and two, and then school assess coursework or SAC tasks in units three and four. Whilst this template is designed specifically for schools seeking to deliver a VCE study for the first time, given that the 2022 to 2026 VCE Biology study design will also be delivered by all schools for the first time in 2022. The VCE curriculum and assessment plans are a useful tool for all teachers when planning and developing their curriculum and assessment programme. Each planning template provides the opportunity for teachers to consider which outcome is being assessed, the anticipated teaching time that they will allocate, the selected relevant units, one to four biology key science skills that you will explicitly develop, practise and allow students to demonstrate the opportunity to show how they can make, say or do that skill through the particular selected learning activities that will be used to provide opportunity for students to demonstrate satisfactory completion of the outcome.

It's important to remember that students should be provided multiple opportunities to demonstrate satisfactory completion of an outcome, and that satisfactory completion of the outcome can be demonstrated up until the time in which results are required to be entered into VASS or any relevant unit. In addition to the evidence that will be collected from students in terms of satisfactory completion of an outcome, schools should also consider the types of assessment tasks that they will use to assess students level of achievement.

As part of the curriculum and assessment programme schools and teachers develop, it's also important that you consider formative versus summative assessment. And so we provide these questions for you to consider how you will address each of them in relation to each outcome, and also in relation to each unit. Different approaches to addressing these questions and different approaches to formative and summative assessment may be used in different units, and also may vary across units one and two, and units three and four, to ensure that the VCE Assessment Principles are adhered to and supportive. Assessment at units one and two is school-based, school-based tasks determine levels of achievement for students, and then, also, there is a list which is evidenced by a list of selected tasks to choose from in relation to outcome one and outcome two, and procedures for assessment of satisfactory completion are a matter for school decision.

Further advice outlining the scope of tasks that may be selected for unit one and two, as well as general considerations when developing the student directed assessment tasks for unit one outcome three, and unit two outcome three, will be available as part of the new VCE biology study page under assessment advice in the support materials. For units three and four in the VCE Biology 2022 to 2026 study design, unit three school-assessed coursework will contribute 20% towards a student's study score. Unit four, school assessed-coursework will contribute 30%, while now the end of your examination will contribute 50%.

Further advice, including sample approaches to developing each of the designated school-assessed coursework tasks, and performance descriptors will be available as part of the new and updated VCE Biology study page, under assessment advice in the support materials. Whilst there are four tasks that need to be completed by all students across the outcomes in unit three and four in any given year, there is inherent flexibility for students to choose the outcome that each task is selected for, the context and stimulus material that is used to form a basis of each assessment task, as well as the relevant units one to four biology key science skills that are chosen to be explicitly assessed in each task. Schools and teachers can use this flexibility to vary the contexts, vary the outcomes, and vary the specific unit one to four biology key science skills to ensure that authentication is maintained, and the integrity of the VCE Assessment is also supported.

In the next three slides overarching relevant key science skills that relate to each SAC task type have been included to support teachers to consider which relevant key science skills they may support students to demonstrate, depending on which outcome the tasks are selected for. Schools may also like to choose other relevant key science skills that are assessed in each task, depending on their student cohort and school context. Additionally, depending on the stimulus material chosen to develop a specific SAC task each year, the specific VCE Biology units one to four key science skills from the tables on page seven to eight of the study design will vary from school for school, and also from cohort to cohort.

There is a new unit for outcome three scientific poster format, and the 600 word limit for the scientific poster will require that students carefully consider what information they will include to ensure effective science communication. Teachers should assess some components of the investigation through log book entries, particularly probably some of the background information, data manipulation and discussion of results. Whilst other aspects of the student designed investigation will be assessed through the scientific poster, poster title, student name identification, tables, graphs, flow charts, figures, captions, references and acknowledgements should not be included in the poster word count. And within the mandated sections there can be some tailoring of organisational elements that students can adapt to suit their own presentation and poster. Further advice regarding suggested approaches to assess unit four outcome three will be available as part of the new VCE Biology study page, under assessment advice in the support materials, and you may also like to access further reasoning for the new poster format by accessing the video that is available via the QR code included in the slide.

In addition to the resources previously provided at the beginning of the presentation, all of the resources listed on this slide provide advice and support for teachers in the implementation of the VCE Biology study design. Some of these resources are available via the VCAA website, some are available as part of your school policies and procedures, and others are available via the school's VAS platform, which is accessible either via your VCE coordinator or VAS coordinator.

Additionally, if you haven't already subscribed to the VCAA bulletin, you can do so via the QR codes included. Notices to schools are also released on Wednesdays during school terms, and they can also be accessed via the VCAA website.

Thank you for listening, and for all the planning and preparation I know that you will be undertaking to provide your students with a range of engaging, teaching and learning activities, as well as ensuring rigorous and fair assessment of the revised VCE Biology study designed for 2022 to 2026.

I'm more than happy to be contacted for any additional queries you may have in relation to VCE Biology on the details provided. And if you do have any questions relating to the overall delivery of VCE, please contact the VCE unit on vcaa.vce.curriculum@education.vic.gov.au.

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