



# VCE Science Teachers Conference Series 2021

## CHEMISTRY

17th February 2021

All sessions will be recorded and available to view until late 2021

### Focussed on the Future

#### Welcome to VCE Chemistry Teachers 2021 Online Conference

This year we have assembled a very exciting, diverse and engaging program with a blend of live and pre-recorded presentations and workshops.

As you can see from the attached synchronous program, we will run seven simultaneous virtual rooms and these will all be accessible on the day via a dedicated Zoom link and we hope that you take advantage of the chat function and ask the presenters many questions to ensure it is interactive.

Highlights include the Keynote Address by Professor Craig Hutton, the VCAA Update by Maria James and the Chief Assessor's Examination Report by Chris Dwyer. We have also added for the first time a new and exciting Discussion Panel which will be chaired by Professor Deb Corrigan. This will be run as an after school session which hopefully will encourage teachers who cannot join the conference during the day to participate in a conversation on some of the big issues in Chemistry education.

There are also some pre-recorded presentations which you can view at your convenience either before, during or after the conference and offer a great resource.

We would also like to acknowledge and thank our generous exhibitors and sponsors and we encourage you to click on their logos on the interactive wall and learn more about their products and services during the breaks in the program. Some of them will also present a short twenty minutes live session or pre-recorded presentation and be available on the day for answering your questions either via the chat function on Zoom or directly via phone or email.

Finally, thank you for participating in this conference, thus ensuring you stay fully informed of the key issues in the VCE sciences. We trust you will enjoy and find the sessions interesting and rewarding.

Alexandra Abela  
President, Science Teachers' Association of Victoria Inc. (STAV)

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# Synchronous Sessions

## live on 17th February 2021

**8.45am - 8.55am** **Welcome & Housekeeping by Alexandra Abela, STAV President**  
**CEA Welcome, Melissa MacEoin, CEA President**  
**Keynote Speaker Introduction by Alexandra Abela, STAV President**

**8.55am - 9.40am** **Keynote: Professor Craig Hutton, University of Melbourne**  
**“Wonderful world of Peptides and Proteins”**



Craig Hutton obtained his BSc(Hons) and PhD degrees from the University of Adelaide before appointments at the University of California, Berkeley, the University of Melbourne and the University of Sydney. He returned to Melbourne in 2003 where he is now Professor.

He will discuss the development of new methods for the synthesis and ligation of peptides, synthesis of biologically active cyclic peptide natural products, and the development of radiolabeled peptides for PET imaging of cancer.

**9.40am - 9.50am** **Short Break**

## Session A **9:50am - 10:35am**

**A1 Maria James, VCAA**

**“Planning and developing SAC tasks for teachers new to VCE Chemistry”**

Are you new to teaching VCE Chemistry? Using other people’s SAC tasks, or those from commercial companies, or VCAA past examination questions, can often compromise the VCE assessment principles of fairness, balance, equity and efficiency. This workshop will outline common pitfalls in designing SAC tasks as well as providing suggestions and stimulus materials as starting points for the development of tasks that will be unique to each school, thereby avoiding authentication issues. The use of VCAA performance descriptors will also be discussed. Participants will be provided with a SAC task development checklist.

**A2 Patrick O’Shea, Loreto College Ballarat**

**“Indigenous chemistry and science”**

Different science agencies are starting to realise and study just how much science Indigenous Australians have always used. The more researchers investigate, the more they are coming to respect and benefit from indigenous understanding of fire management, plant extracts and animal behaviour. This session will detail some of the knowledge emerging from our universities and medical research of indigenous science.

**A3 Louise Lennard, Methodist Ladies College**

**“Ideas for conducting the Practical Investigation for AOS 3 Unit 4 Chemistry”**

The VCAA Unit 4 Chemistry Study Design includes AOS3, a Practical Investigation regarding energy and / or food. This workshop will look at suggestions for planning, conducting and assessing the Practical Investigation (AOS 3), including student submission of a scientific poster

### **A4 Carolyn Drenan, Lalor North Secondary College & Nicole Dobson, Whittlesea Secondary College**

#### **“Teaching Units 1 and 2 VCE Chemistry”**

This session will focus on how you might like to teach Units 1&2 VCE Chemistry in 2021. Come along for some useful information on how to sequence the year from a teacher and student perspective. We will work through Unit outlines, ideas for engaging students with practical activities, demonstrations, writing risk assessments for the laboratory and developing SAC tasks. This workshop is targeted for Graduate, Early Career Chemistry Teachers or returning teachers to VCE Chemistry. The workshop is being presented by the Early Chemistry Careers Network (ECCN), which is part of the Chemistry Education Association (CEA).

### **A5 Alex Colussa, Trinity Grammar School & Michelle Roberts, Doncaster Secondary College**

#### **“Teaching VCE Chemistry Units 3 and 4”**

This session will support the teaching of Units 3 & 4 from the 2017-2021 VCE Chemistry study design.

Main focuses include

- Structuring and writing assessment to pass an audit (as outlined by VCAA audit report)
- Sequencing the year from a teacher and student perspective, including unit outlines and scheduling of the AoS3 Practical Investigation.
- Activities and methods for addressing difficult concepts.
- Demonstrations, practical activities, use of ICT resources including interactive simulations.
- Structured revision activities for the final examination.

This workshop is targeted for Graduate and Early Career Chemistry Teachers.

The workshop is being presented by the Early Chemistry Careers Network (ECCN), which is part of the Chemistry Education Association.

## Lightning Session A

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**9.50am - 10:10am**

### **A6.1 Sue Neale, Bayside P-12 College**

#### **“Chemistry Network”**

Are you the only chemistry teacher in your school?

Have you always wondered how a chemistry network can be set up and utilised?

This session will use the experiences of Northern Chemistry Network to demonstrate the benefits of a network to the students you teach, your professional development and your sanity. At the conclusion of the session there will be the opportunity to share details to commence the process of setting up a network in your geographical area.

### **A7.1 Tom Holding, Bankfirst**

#### **At Bank First, we're invested in you.**

Bank First is owned by its customers and exists to financially empower the people who help build better communities. Since 1972, Bank First has helped over 200,000 Australians with their banking needs; from saving for a rainy day, to purchasing their first home and planning for retirement.

Driven by care and compassion, Bank First is committed to providing a better banking experience and putting its customers first.

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#### **5 minute break**

**10.15am - 10:35am**

### **A6.2 Melissa MacEoin, St Margaret's and Berwick Grammar School**

#### **“How do you solve a problem like Year 10 Science?”**

How does one design a Year 10 Science program that best meets the needs of all students? There is an inherent need to balance a program that is interesting, accessible and relevant to ALL year 10 students, as well as extend, prepare and develop students who want to go on and excel in subjects like VCE and IB Chemistry. With these questions in mind, I asked for feedback from CEA (Chemistry Education Association) members about the structure and content of their own Year 10 courses, and how well they thought these programs prepared students for VCE Chemistry. I received responses from 62 schools, and this pre-recorded presentation will summarise the information provided, and the questions raised. As a new Study Design is currently being developed, questions about what is covered universally at Year 10 level in relation to Chemistry, are particularly relevant, as this is used to inform discussions about the content required as part of the Year 11 course. At the end of the presentation I will be hoping to facilitate a conversation about these questions, with the possibility of passing our feedback on to the new study design committee.

### **A7.2 Luke Sanders, Studyclix**

Luke Saunders, Studyclix founder and science and mathematics teacher will give you an overview of [Studyclix.com.au](http://Studyclix.com.au), Victoria's fastest growing study and teaching website. Luke will show you how you can get set up with a free account and use Studyclix to generate exams and quizzes for your classes using official VCE exam questions as well as a range of trial exam questions. If you want to make your life as a teacher easier and your student's learning experience enriched then don't miss this presentation!

**10.35am - 10.50am**      **Morning Tea Break**

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# Session B

10:50am - 11.35am

### **B1 Lisa Shalders, Firbank Grammar School, Sonia Poetrodjojo, Glenroy College & Lisa Chiavaroli, Deakin University**

#### **“Instructional strategies for comprehending chemistry texts in the VCE chemistry classroom”**

VCE Chemistry students are often asked to comprehend scientifically dense text-based content for both learning and assessment. Many secondary students lack the complex skills required to successfully decode scientific text because general comprehension strategies do not address the unique language conventions of chemistry. VCE Chemistry teachers participated in a co-designed professional learning project that provided research-informed instructional strategies to support students with discipline-specific comprehension. Pre- and post-tests were used to evaluate the effectiveness of the strategies for student comprehension. In this workshop, teachers will share the strategies they have used and also reflect on the successes and failures of implementing these strategies during remote learning.

### **B2 Peter Razos, Caulfield Grammar School**

#### **“Delivering a Remote VCE course. It’s an experience”**

Nothing new in saying “Online requires immense preparation and ability to have all resources at the ready to engage.” In sharing our resources we hope that you can use them in the way the we at Caulfield Grammar used them with great impact. All participants will be shown (given) the resources available along with a discussion on how they were used and how to maximise their impact. Below is a link to the VCE Chemistry (Unit 4).

[http://www.dynamicscience.com.au/tester/solutions1/chemistry/timelineunit4\\_2016\\_2021.html](http://www.dynamicscience.com.au/tester/solutions1/chemistry/timelineunit4_2016_2021.html)

But while I’ve got you here why focus on VCE only. Let us show you an incredibly successful unit on kitchen chemistry. We delivered this remotely and live cooked our way to a wonderful understanding of particle theory and chemical reactions. Making violet crumble (decomposition reactions), rock candy (saturated and supersaturated solutions) and of course donuts excited and captured every student’s attention. What a wonderful experience having parents also join in. Below is the link. Look forward to cooking up a storm.

<http://www.dynamicscience.com.au/tester/solutions1/chemistry/juniorsciencefoodchem/UntitledFrameset-2.html>

### **B3 Adele Hudson, Aitken College**

#### **“Designing 25-50-25 SACs”**

The challenge for VCE teachers is to design SACs that are an appropriate level of difficulty for their class. In this session I will model how to design SACs with 25% of questions requiring low order thinking skills, 50% requiring middle order thinking skills and 25% requiring high order thinking skills. Using a process where questions are categorised using the learning taxonomies, Blooms and SOLO, I will focus designing the big ideas SACs, ‘Response to stimulus material’ and ‘Analysis and evaluation of data’.

### **B4 Seamus Delaney, Deakin University**

#### **“Situating green chemistry and sustainable development in the chemistry classroom”**

This interactive workshop will outline classroom activities that directly relate to critical challenges, such as those highlighted by the United Nations Global Goals for sustainable development (SDGs). These activities have been co-designed with contemporary science researchers who are actively addressing the global, holistic, complex nature of challenges such as sustainable development. Incorporating systems thinking skills into chemistry and materials science has been proposed as a means to connect students with contemporary science contexts addressing SDGs (biodegradable plastics, e-waste, novel battery technologies). Systems thinking and its relationship to critical thinking, design thinking, and the general capabilities of the Victorian Curriculum will also be explored.

**B5 Elizabeth Leong, Mentone Girls' Secondary College****“Impacts of Online Learning on VCE Science Enrolment”**

The year 2020 has proven to be a seemingly never ending challenge for all educational institutions. Educational developers and teachers scrambled to put together units of learning that were vigorous and engaging for students to complete during the online learning season. But did we succeed? 34.3% of students surveyed at a local secondary school claim that the changes to the delivery of science this year has negatively affected their decision to pursue a science subject at VCE. This research aims to provide an understanding on whether or not online learning has impacted VCE enrolments for 2021.

**Delegate Note:** This abstract is more focused at science based VCE subjects in general. I am hoping to put one more through for a Chemistry focused one.

## Lightning Session B

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**10:50am - 11.10am****B6.1 Nic Volkmann, VolkScience****“Flipped Learning in the Chemistry Classroom”**

With the huge amount of content in the Chemistry Study Design, it can be difficult to cover all areas in detail. By ‘flipping’ the chemistry classroom, students can learn content outside class and then utilise class time to work on problem solving and application of their knowledge. The use of custom made videos, specifically constructed for the current Study Design, will be shown and effective methods of utilising these will be discussed.

**B7.1 Kelly Hollis, Education Perfect****“Using EP Science to Track Student Performance”**

Education Perfect allows teachers to closely track student performance in both independent learning situations and in formative and summative assessment scenarios. EP provides a quick and easy way for teachers to monitor students as they work through lessons or to gather unparalleled data on student performance using the secure EP Assessment platform. In this session we will explore how teachers can use EP to achieve all of these things with minimal time and effort.

**5 minute break****11:15am - 11.35am****B6.2 Nic Volkmann, VolkScience****“Beginning Teachers Toolbox of Tricks”**

Teaching Chemistry for the first time can be very challenging, even more so if you are a beginning teacher. In this session I will share with you some of the tips and tricks I have learnt over the last 10+ years teaching Chemistry which have not only improved student learning but have decreased my stress levels, increased my organisation and made teaching more enjoyable. These are the things I wish I'd known when I first started teaching.

**11.15am -11:35am****B7.2 Laura Dortmans and Katherine Roan, Edrolo**

Hundreds of schools across Victoria are now using Edrolo's Science textbooks and online resources. Join us for a Q&A session with the lead author Katherine Roan, who will talk through our new Chemistry textbooks, and share how other teachers have been using the resource

**11.35am - 11.45am Short Break**

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# Session C

11.45am-12.30pm

### **C1 Melissa MacEoin, St Margaret's and Berwick Grammar School**

#### **“Teaching Organic Chemical Pathways in Unit 4 Chemistry”**

Do your students find this part of the course difficult to absorb? Are they daunted by the many reactions and conditions they need to remember? In the past few years I have fine-tuned the way I lead my students through this process, and am happy to share what I do. By the end of the lessons in question the class have created a giant ‘floor model’ flowchart, using molecular models, post-its and index cards. I will also share some reflections on how this seems to help my students understand and learn this material. The pre-recorded presentation will take you through the set of lessons, and you will take away a written plan. During and after the presentation, I will be available to facilitate a discussion and answer questions.

### **C2 Sue Neale, Bayside P-12 College**

#### **“Five Minute Book”**

The five minute book is a technique used by a VCE chemistry teacher to challenge students to use their chemistry knowledge to explain everyday examples. Come to this session to see how this weekly activity can allow students to take risks in their writing to enable them to explore and identify the chemical principles behind new and different situations.

### **C3 Mick Moylan, University of Melbourne**

#### **“Some quick revision of NMR”**

NMR is an important topic in VCE Chemistry, and while there are many aspects that are fairly simple, there are some particular structures that are tricky or have spectra that are hard to predict. In this interactive session, I'll be answering all your questions about NMR with a quick intro movie about the theory of NMR and then we will go through any problematic structures or spectra you've come across.

Delegate Note: Please use the form at <http://go.unimelb.edu.au/6eni> to submit your questions before the session - or else you can ask them as we go!

### **C4 Oliver Taylor, Surf Coast Secondary College, Hannah Vu, Williamstown High School, Adlin Ramdzan, Mac Robertson Girls High School and Seamus Delaney, Deakin University**

#### **“Utilising System Maps to implement and assess sustainability in the chemistry classroom”**

In this workshop, teachers will share the strategies they have used to implement ‘system thinking’ with their students on various topics. The use of systems maps were adopted to help students link chemical concepts to real-world scenarios and evaluate whether these impacts were positive, negative, or neutral according to the UNTs Sustainable Development Goals. These VCE Chemistry teachers participated in a co-designed professional learning project that provided research-informed instructional strategies to situate systems thinking in the chemistry classroom. They will reflect on the successes and challenges of implementing these strategies and will provide insights for the design of future curricula to encourage student engagement.

### **C5 Caroline Cotton, Biobrain Learning**

#### **“Biobrain - a Chemistry learning tool”**

Want to learn about a new tool to help your students learn and understand Chemistry? Come and find out about Biobrain, a Chemistry learning app that helps VCE Chemistry students master key concepts and test their knowledge with real time feedback on their progress. Students are now able to learn and revise Chemistry anytime and anywhere, on their mobile devices. Key Areas of Study are separated into topics and graded over three levels of difficulty. Biobrain uses diagrams and text to illustrate key concepts, and has a variety of question types for students to test their knowledge. Students can also keep track of their scores, review answers, and retake quizzes to ensure full understanding and learning over time. Biobrain's learning materials include links to an illustrated glossary to assist learning without leaving the screen. All participants will receive a free trial of Biobrain.

## Lightning Session C

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**11.45am - 12:05pm**

**C6.1 Michael O'Brien, Newbyte**

**C7.1 Jasmine Lynch, ARC Centre of Excellence in Exciton Science**

**“Functional lattice structures for Unit 1 Chemistry”**

In Unit 1 Chemistry we explore ionic, metallic and covalently bonded lattice structures with students. However, we don't often get much past diamond, Sodium chloride and copper wire when exploring the examples and applications of this fundamental chemistry. Understanding lattice structure is hugely important in the fields of nanotechnology and renewable energy innovation. This session will reveal accessible examples for teachers such that their students can gain a deeper understanding of how fundamental bonding models are allowing the synthesis of the next generation of solar and lighting technology in research teams here in Australia.

**5 minute break**

**12.10pm - 12:30pm**

**C6.2 Misal Belvedere, Pearson**

**“Heinemann Chemistry 5th edition: delivering VCE success in 2021 and beyond”**

While we wait to better understand the requirements from VCAA of the upcoming study design, the Science Team at Pearson is working hard to understand the needs of VCE Chemistry teachers. Our goal is to deliver the best resources for VCE Chemistry success and to support a life-long love of chemistry.

Join us to explore how we will be improving upon our trusted resource, Heinemann Chemistry 5th edition, and to have your say in the development of the next edition.

**C7.1 Jasmine Lynch, Continued session**

**12.30pm - 1.10pm**

**Lunch Break and Networking**

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## Chief Assessors 1.10pm - 2.10pm

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**Chris Dwyer and Peter Skinner**

**“Exam Report and Q&A.”**

**2.10pm - 2.20pm**

**Short Break**

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## VCAA Update

**2.20pm - 3.05pm**

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**Maria James, VCAA**

**“VCAA Chemistry Update”**

The review of VCE Chemistry has re-commenced with the consultation draft to be available for public comment 1 June - 3 Aug 2021. What factors are being considered by the panel? What are the expectations, including numeracy, for students entering Units 1 and 2 Chemistry? Should all students be able to write balanced chemical equations for the reactions between acids and carbonates by the end of Year 10? How will School-assessed Coursework audit outcomes inform assessment? What have we learned from COVID-19 restrictions that will inform the review process? This session will outline the factors that influence VCE study design reviews.

### 3.05pm - 3.30pm Afternoon Tea Break and Networking

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### Discussion Panel 3.30pm - 5.00pm

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#### The BIG Questions for the Future of VCE Chemistry

Teachers are invited to join in a conversation and drawing on their expertise in the break out rooms.

##### Chairperson

##### Professor Deb Corrigan, Monash University

- What will the future classroom look like? Hybrid of face to face and online learning? What are the challenges that students and teachers will face?

**Michelle Dennis, Haileybury College**

- How do you teach and assess for "creativity" rather than just focus on the content and the technical elements?

**Dr Jennifer Mansfield, Monash University**

- What if ATAR scores are removed? What will be the appropriate model for assessment? How will the teachers be judged?

**Professor Russell Tytler, Deakin University**

- How does Chemistry fit into STEM literacy and STEM education and vice versa?

**Dr Jared Carpendale, Monash University**

- How do we introduce more complexity into the curriculum while maintaining the students engagement and interest in science.

**Dr Emily Rochette, University of Melbourne**

- What if Biology, Chemistry and Physics were not separated and were just classified as General Science? Is this possible? what would the curriculum look like? what are the benefits and what are the downsides? what would be the implications for teaching and students?

**Debra Smith, ACARA**

- What more can we do with F-10 Science teaching? Should Chemistry be introduced earlier?

**Dr Karen Marangio, Monash University**

- Is it time to re-think what is important in the Chemistry curriculum? what would you remove and what would you add to ensure it is relevant to students and what they need to know when they leave school?

**Dr Seamus Delaney, Deakin University**

- Should Chemistry teachers have an accreditation system where they can achieve certain competency levels and thus progress to different levels?

**Dr Rebecca Cooper, Monash University**

**3.30pm - 3.40pm** Introduction by Professor Deb Corrigan and overview

**3.40pm - 4.00pm** Brief Introduction to each of the big questions (2 minutes each) by respective experts

**4.00pm - 4.30pm** Discussion in breakout rooms

**4.30pm - 5.00pm** Feedback from each room (2 minutes each) and concluding remarks by Professor Deb Corrigan

### 5.00pm Conference Close

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by **Alexandra Abela, President, Science Teachers Association of Victoria**

# Asynchronous Sessions

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available to view from 8th February 2021

## **Nicholas Harvey, Siena College & Lisa Chiavaroli, Catholic Education Melbourne**

### **“Developing independent learners for the VCE chemistry classroom - Taking on board the lessons from 2020”**

What can we learn about teaching chemistry in a post remote-learning world? Some students flourished in 2020 while others found the process of learning independently incredibly challenging. We unpack what drives this separation, and examine the skills and habits students need in the chemistry classroom to learn independently and direct their learning.

In the remote-teaching world teachers were forced to change their pedagogies and develop new skillsets and resources to cater for synchronous and asynchronous instruction. This workshop aims to help teachers find ways to use the best of these strategies and resources effectively in their chemistry classroom, and how to guide students to become more independent in their learning.

## **Melissa MacEoin, St Margaret's and Berwick Grammar School.**

### **“Using MolView.org to teach Unit 1 Organic Chemistry”**

Do you have limited access to molecular modelling kits? Do you want your students to be able to relate to molecules in three-dimensions outside of the classroom? Have you not yet discovered MolView.org? This year, remote learning forced me to change my approach to teaching about the shapes of organic molecules (Unit 1 Chemistry), and this short pre-recorded presentation will provide you with lesson plans, and show you how students can use MolView.org in place of the more traditional modelling kit. It will also show you how MolView.org is a quick and easy-to-use tool for creating structural and skeletal diagrams of organic molecules.

## **Adele Hudson, Aitken College**

### **“Developing application skills in VCE Chemistry”**

Application questions are now a focus in the VCAA Chemistry exams presenting teachers with the challenge of teaching the fundamental concepts whilst also giving time to develop students skills in this area. In this session I will give an overview of the skills that are required in VCE Science exams and show how these skills can be progressively developed during Year 11 and 12. Suggested project ideas will be identified for Unit 1&2 Chemistry and ideas for targeted skill sessions will be shown for Unit 3&4 Chemistry.

## **Russell Comb, Oxford**

### **“Oxford University Press - Supporting Victorian science educator”**

Oxford University Press is proud to support Science educators in Victoria. For the past decade we have published market-leading Science resources, and we're just getting started. Learn about how we will continue to support teachers in Victoria with forthcoming resources including Oxford Biology for VCE and new editions of Oxford Science.

## **Studyclix**

# Presenters

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## **Alexandra Abela**

Alex is the President of the Science Teachers' Association of Victoria. She has been a continuous member of STAV since joining as a pre-service teacher in 1993. Since first joining STAV Council in 2001, Alex has held a number of Executive roles, and she is currently STAV's representative on the board of the Australian Science Teachers Association. Alex has held a variety of leadership positions in science education throughout her career. She is passionate about curriculum design, committed to innovation in teacher professional learning, and loves teaching students of Chemistry at Penleigh and Essendon Grammar School.



## **Misal Belvedere**

Misal Belvedere proudly leads the K-12 Science Portfolio at Pearson. Prior to Pearson, Misal completed a Bachelor of Science (Honours), with majors in microbiology and biochemistry and completed a Graduate Diploma in Education (Secondary). Misal worked as a science teacher and Head of Science in Melbourne for 8 years. Misal's career in publishing spans over 12 years, across both print and digital resources. She is passionate about channeling the shared expertise of the Pearson Science team to support educators and learners. Engaging young people and challenging them to ask questions, develop explanations and design solutions is at the heart of Misal's work.



## **Lisa Chiavaroli**

Lisa works as a research assistant for the Deakin University Chemistry Education Professional Learning communities project (DeCEPL). In addition to this role, she consults on a range of Science and STEM education projects for Catholic Education Melbourne. Lisa also works as a tutor of Science education in the Master of Teaching Internship program at the Melbourne Graduate School of Education. She has 10 years of classroom experience teaching VCE Biology, VCE Chemistry and Science.



## **Alex Colussa**

Alex Colussa is the president and committee member for the Early Careers Chemistry Network (ECCN) respectively. The ECCN is a subsidiary of the CEA and provides mentoring, resource development and workshops to enhance Chemistry education for Chemistry teachers across the state of Victoria.



## **Russell Comb**

Russell Comb is an Oxford Education Consultant who specialises in OUPANZ's Science resources.



### Deb Corrigan

Deb is passionate about fostering student enthusiasm for learning science and STEM. she also strives to work closely with teachers, encouraging them to realise the potential of their learning environments.

By considering their students' needs (intellectual, personal and behavioural) teachers can transform their classrooms into learning spaces that support people to question preconceived views, clarify ideas and ultimately, reach a position or consensus. In these ways we can develop creative learners who can engage with and critique ideas, appreciate differing viewpoints and provide compelling reasons why they think the way they do. As Director of Education Futures and a Monash professor, she dedicates her research to challenging accepted wisdom and practices – and traditional views of science education for more contemporary and authentic ones. She also translates her findings into practical strategies, while contributing to curriculum and policy development at a state and federal level.



### Caroline Cotton

Caroline is an experienced Biology / Chemistry teacher and the founder of Biobrain. Biobrain develops STEM learning apps for VCE Biology, Chemistry and Physics students. Caroline has developed curriculum for the past 20 years in various formats and decided to create the Biobrain learning apps to help students learn and revise key concepts in a format that they are used to interacting with for everything. Caroline also teaches the Masters of Education program, provides revision lectures for students and provides professional learning for Biology teachers.



### Seamus Delaney

Seamus Delaney (@delaneysw) is a Lecturer in the School of Education, Deakin University, where he teaches Chemistry, Primary and Secondary Science pre-service teacher education. He is currently Secretary of the Chemistry Education Association, and recently co-founded the Elements of Sustainable Chemistry interdisciplinary research hub.

Hannah Vu, Oli Taylor and Adlin Ramdzan are all VCE Chemistry teachers who in 2020 were part of the Deakin University chemistry education professional learning communities project (DeCEPL), financially supported by the CEA. In this PL project, they co-designed an innovative classroom activity with teachers from different schools and the project team, incorporating the latest chemistry education research.



### Nicole Dobson

Nicole Dobson is a VCE chemistry teacher and learning specialist in vertical curriculum school with an elective based structure at Whittlesea Secondary College. She is passionate about student led learning, reliable assessment using developmental rubrics, and engaging science lessons and programs.

### Carolyn Drenan

Carolyn Drenan has been teaching VCE Chemistry in secondary schools for the past 7 years, currently at Lalor North Secondary College. In her role as ECCN Committee Member, she has presented this Workshop at previous VCE Chemistry Conferences since 2015 and also connects with Pre-Service Teachers in her role of University Liaison.

### Chris Dwyer

## Nicholas Harvey

Nicholas is the Head of Science at Siena College. He has taught VCE Chemistry since 2012 and has been actively involved in Chemistry Education through the ECCN, CEA and most recently the CEM Science Network. As an assessor and examiner for VCAA he has insight into the skills and understanding that students need for success in VCE Chemistry. He is keenly interested in formative assessment to guide learning, developing science students' literacy and numeracy skills, igniting students' passion for science inquiry and collaborating to improve pedagogy.

## Tom Holding

Tom Holding is a Relationship Officer with Bank First. His principal role is to visit schools, tertiary institutions, and allied health - in particular their staff and students in order to assist them with their finances and help them achieve their financial goals. Tom looks after the Western region, ranging from inner city suburbs of Melbourne, all the way down to Colac and the Great Ocean Road, visiting both primary and secondary schools.



## Kelly Hollis

Kelly Hollis is the Global Head of Science for Education Perfect. She is a qualified Science teacher with a Masters in Educational Technology. Wearing many hats in her role, Kelly is an ambassador for flipped learning and the effective use of technology in the Science Classroom. She wears many hats in her role as an Education Technology expert and has been instrumental in building a strong culture of resource sharing and thought leadership online.



## Adele Hudson

Adele teaches VCE Physics and Chemistry and General Science at Aitken College and is also Head of Science. She has developed a range of tools to identify the skills that students require in VCE Science exams. With the move towards high level thinking skills in all the sciences, she has worked with others on developing project based learning experiences in Year 10 and 11 that strengthen students skills in these areas. All those involved in the project have found the quality of work has improved due greater student motivation which has also resulted in higher participation rates in VCE Science.



## Maria James

Maria is the Science Curriculum Manager at the Victorian Curriculum and Assessment Authority, having previously held school positions including Head of Science, Dean of Students and Head of Senior College. Maria holds a Masters degree in Education and has written junior science and senior chemistry textbooks. She is passionate about motivating and engaging students with science. A particular interest for Maria is encouraging students to apply their knowledge and skills in science and in other areas to take action in local and global contexts.

## Louise Lennard

Louise works at MLC teaching VCE and IB Chemistry. She is also a coauthor of Heinemann Chemistry 5th Edition and presenter of Unit 1 and 2 Edrolo videos. She is also an experienced VCAA assessor.



### Elizabeth Leong

Elizabeth Leong is a graduate teacher at Mentone Girls' Secondary College and an alumni of Monash University's Chemistry and Science Education Researchers (ChaSERs). Her honours thesis was surrounding the success of student transition from secondary to tertiary Chemistry studies at university. Elizabeth has a passion for making science engaging and accessible to learners of various backgrounds and this has led to her interest in education research.



### Jasmine Lynch

Jasmine is a VCE Chemistry teacher and science teacher with a passion for making her teaching relevant, creative and engaging for students. She has spent the last couple of years working in research Centres across Monash and Melbourne Universities where she designs curriculum aligned workshops and outreach opportunities to make the cutting-edge science of the academic teams accessible to students and teachers in STEM. She is currently based at the ARC Centre of Excellence in Exciton Science where researchers are working towards a renewable energy future through innovative solar and lighting technologies.



### Melissa MacEoin

Melissa MacEoin is a chemistry teacher from St Margaret's and Berwick Grammar School, Berwick. She has been teaching for too many years to mention, but still loves the sheer joy that can come from introducing students to the wonders and mysteries of chemistry. Melissa also has a background in English, and drama and theatre, and enjoys the way chemistry requires students to view and analyse the world from so many perspectives. Melissa is currently serving as president of the Chemistry Education Association (CEA).



### Mick Moylan

Mick Moylan is a Senior Lecturer in Chemistry at the University of Melbourne and also Project Officer for the Chemistry Education Association. Mick currently runs lab programs where Year 11 and 12 students use the instruments in Units 2 and 4 chemistry and has spent hundreds of hours in school classrooms in his former roles at the University and in CSIRO Education. In his tertiary teaching, Mick is a coordinator of the BSc(Extended), which is a degree program for talented Aboriginal and Torres Strait Islander students. Mick also teaches subjects within the chemistry major at the University, with a particular focus on the secondary-tertiary transition.

### Sue Neale

Sue Neale is a VCE Chemistry teacher. She is currently on the board of Chemistry Educational Association. Sue has spent the last 30+ years in rural Victoria teaching students in mainstream, specialist, primary, secondary and tertiary education.



### Michael O'Brien

A senior Biology/Chemistry teacher for 10 years, Michael established Newbyte Educational Software. Personally developing more than 20 highly interactive educational science programs over the last 30 years. He has also been an international consultant on projects for both the Malaysian and Scottish education departments, involving software design for biology courses.



## Pat O'Shea

Pat O'Shea is a Deputy Principal and chemistry teacher at Loreto College Ballarat. Pat has a long history of involvement in textbook and trial paper writing. He has also presented at the STAV conference for the last 25 years.



## Sonia Poetrodjojo

Sonia is a VCE Chemistry teacher at Glenroy College for the past three years and a Teach for Australia alumni. She also teaches mathematics and Indonesian and is currently the Languages Domain Leader.



## Aldin Ramdzan

Aldin Ramdzan is a VCE Chemistry and Science teacher at Mac.Robertson Girls High School for the past two years. Prior to that, she had actively tutored in the Department of Chemistry at Melbourne University while completing her PhD which led her to discover her passion in teaching.



## Peter Razos

Head of Middle School Science Caulfield Grammar (Caulfield campus)



## Michelle Roberts

Michelle Roberts is the president and committee member for the Early Careers Chemistry Network (ECCN) respectively. The ECCN is a subsidiary of the CEA and provides mentoring, resource development and workshops to enhance Chemistry education for Chemistry teachers across the state of Victoria.



## Emily Rochette

Emily Rochette is a classroom science teacher and lecturer at The Melbourne Graduate School of Education. Her research interests are situated with understanding teachers' use of digital technologies in the science classroom as they teach both in- and out-of-field.

## Luke Saunders

Luke Saunders is a Science and mathematics teacher and is the founder of Studyclix.com.au, Victoria's fastest growing website. Luke is passionate about teaching and learning and believes in the power of technology in helping enrich student's learning.



## Lisa Shalders

Lisa has 7 years of classroom experience teaching VCE Chemistry, Science and Mathematics. She is currently teaching VCE Chemistry and Science at Firkbank Grammar School. She is passionate about making Chemistry accessible and relevant for all students. Lisa has a particular interest in encouraging more young women to pursue further study and careers in STEM.

**Peter Skinner**

Peter Skinner is currently a Year 11 and 12 VCE and IB Chemistry teacher at Geelong Grammar School and has been co-Chief Assessor for both 2019 and 2020, and has been a VCE assessor since 2004."

**Oli Taylor**

Oli Taylor is a VCE Chemistry and Environmental Science teacher at Brunswick Secondary College. Oli is very interested in integrating environmental education into chemistry lessons.

**Russell Tytler**

Professor Russell Tytler is Alfred Deakin Professor and Chair in Science Education at Deakin University, Melbourne. He has researched and written extensively on student learning and reasoning in science. His interest in the role of representation in reasoning and learning in science extends to pedagogy and teacher and school change. He researches and writes on student engagement with science and mathematics, school-community partnerships, and STEM curriculum policy and practice. His current interest is in interdisciplinarity leading to critical and creative reasoning. He is widely published, and has been chief investigator on a range of Australian Research Council and other research projects.

**Nic Volkmann**

Nic is an experienced VCE Chemistry teacher with a passion for Flipped Learning. This led to the creation of VolkScience, where her mission is to provide affordable access to high quality VCE Chemistry Units 1-4 video tutorials & resources to support teaching and learning for both teachers and students.

**Hannah Vu**

Hannah Vu is a VCE Chemistry and Maths Methods teacher at Williamstown High School in the past 5 years.