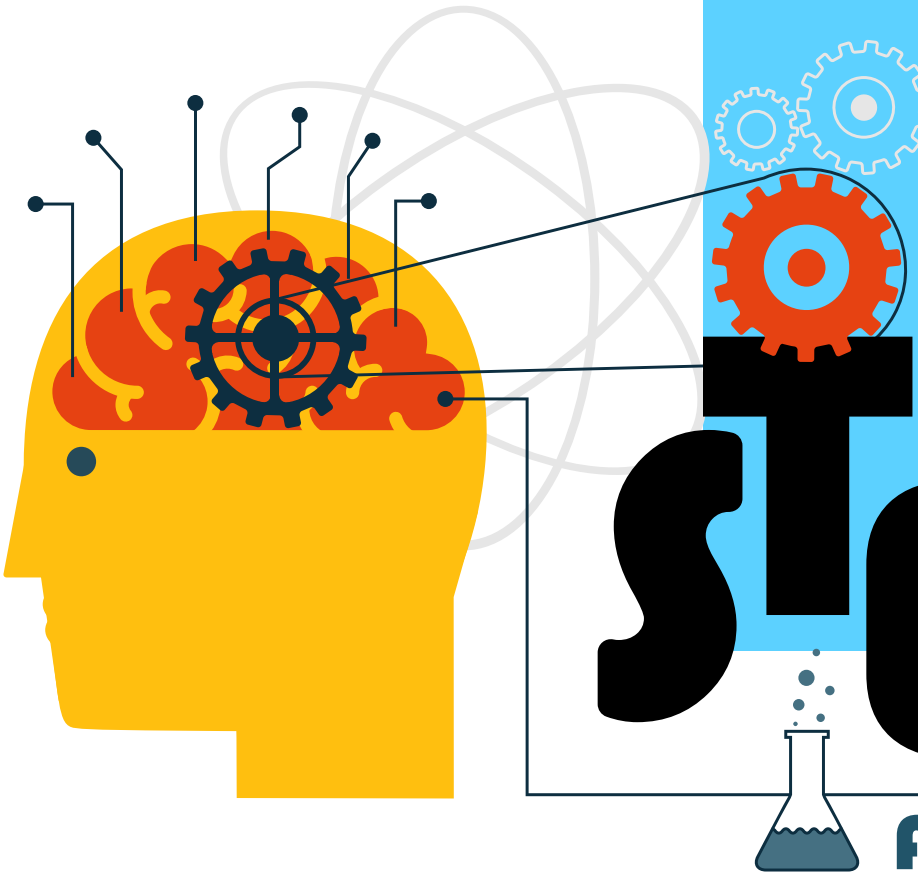

2019 STEM conference

29 November

Adelaide Botanic High School

program

SASTA South Australian Science Teachers Association

MASA Mathematical Association of South Australia

supported by credit unionsa

Timetable

8:30 am	Registration	Gym
9:00 am	Welcome	Theatre
9:15 am	Keynote presentation	Theatre
10:25 am	Morning tea	Gym
10:55 am	Workshop Session 1	
12:00 pm	Workshop Session 2	
1:00 pm	Lunch	Gym
1:50 pm	Workshop Session 3	
2:55 pm	Workshop Session 4	
4:00 pm	Happy Hour	Terrace

Keynote presentation

Gender Equity – it's Not Rocket Science

Professor Lisa Harvey-Smith
Australian Government Women in STEM Ambassador
Professor of Practice in Science Communication, UNSW

In this talk, astrophysicist and Australia's Women in STEM ambassador Professor Lisa Harvey-Smith will discuss some of the ways in which educators can support student engagement in STEM and encourage more girls to pursue these disciplines in further and higher education.

Sponsors

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Texas Instruments

Actuaries Institute

NEOPOST
Send.Receive.Connect.

inspire STEM education

Environmental impact

Catering

The caterers will provide bamboo compostable plates and cutlery for the event to reduce the amount of waste being sent to landfill. Please be sure to place these items in the green/organic bins provided around the School.

Printing

All conference information will be available online this year, including the program. Delegates will have wi-fi access at the conference so please bring along a device to access these details.

While it is a condition of the conference that you always wear your provided name tag, we do invite you to return them at Happy Hour so these can be recycled for future events.

We have also encouraged presenters to consider electronic distribution of workshop resources to reduce the amount of printing and paper used at the conference.

The conference evaluation will be sent electronically after the conference and a PDF copy of your certificate will be sent via email the week following the conference.

Satchel inserts

Delegates will be provided with a satchel which will include information from SASTA, MASA, sponsors, trade displays and others – whose support is vital to conferences such as this. Please take this information back to your school for the interest of colleagues before recycling material.

Venue – Adelaide Botanic High School

- ABHS was created with a 5-Star Green Star As-Built rating – see www.gbca.org.au/uploads/212/34772/Introducing_Green_Star.pdf
- Environmental design of the building minimises energy and water use, in support of the city's 'Adelaide to Zero Carbon Challenge'
- Building materiality, services and operations are exposed to illustrate the function of the building, and how energy and water use is captured, so students and staff are aware of their environmental footprint and performance of the building.
- Taking a 'passive design' approach, the new school harnesses the external climate to maintain a comfortable temperature indoors. The buildings share north-south orientation to maximise natural light, coupled with all learning areas having fresh air supply. A responsive membrane roof sits over the atrium, maximising admission and control of light – additional shade is provided during summer and increased daylight in winter.
- Drought tolerant plants have been used to landscape the gardens.
- The school focuses on reducing emissions by promoting green, active travel for students and teachers with its location and connection to a large walking, cycling and public transport network.
- All levels of the school have been equipped with three bins recycling system and water fountains to assist reduction of waste.

Transport

Unfortunately, there is ***no onsite parking*** at Adelaide Botanic High School for the conference, however this provides an opportunity to reduce our carbon footprint by using public transport or carpooling with a colleague!

Public transport

- The school is easily accessible via public transport with the Botanic Gardens tram stop located a 5-minute walk from the school and bus stops located outside the entrance on Frome Road (Stop 1A). For more details and to plan your journey visit Adelaide Metro: adelaidemetro.com.au/planner
- Adelaide Entertainment Centre – Park'N'Ride – $5 per day theaec.net/ConcertsEvents/VenueInfo/Parking.aspx
- Adelaide Convention Centre – $16 early bird parking adelaidecc.com.au/content/uploads/2019/10/ACC-Car-Parking-Rates-2019-2020.pdf

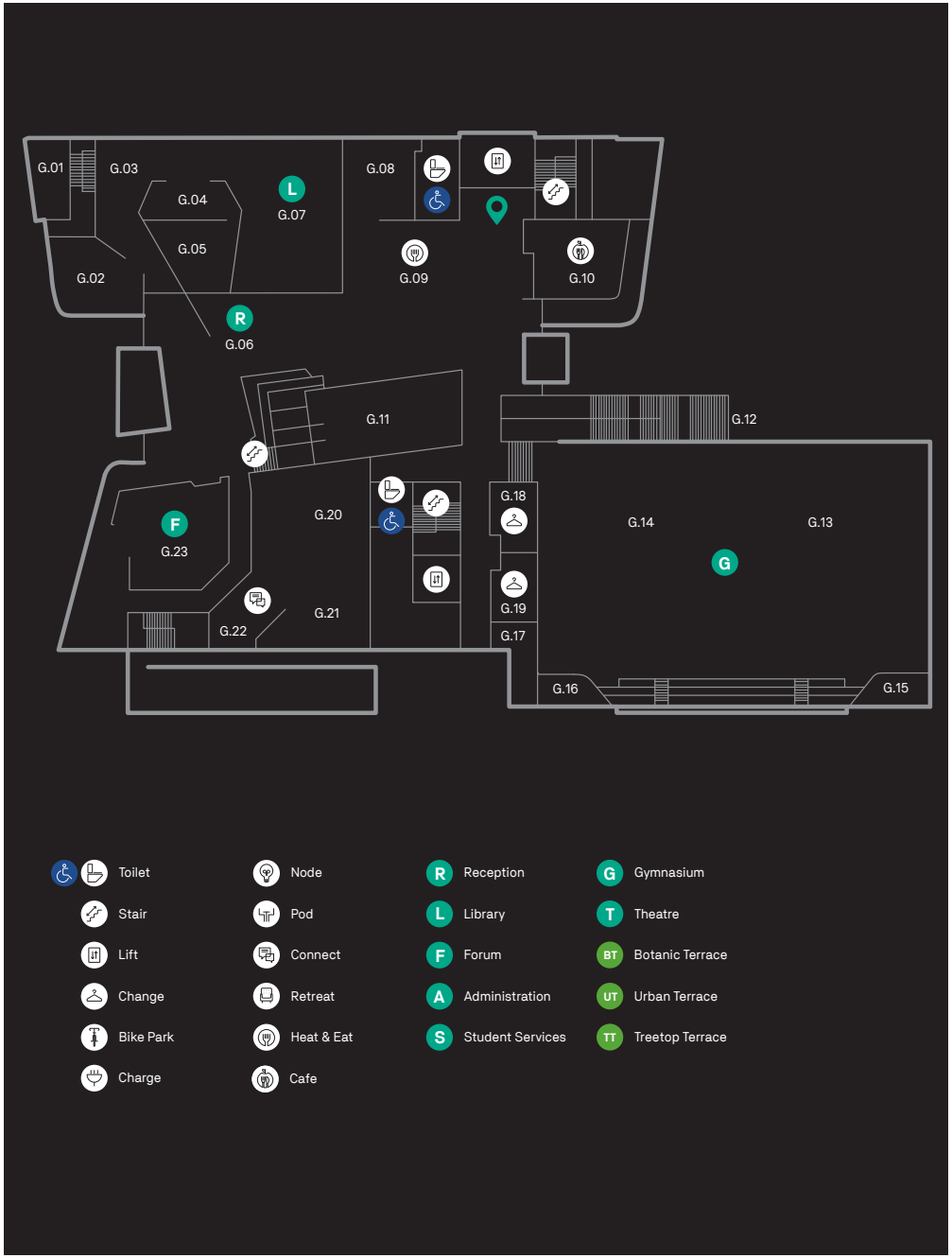
Public Car Parking

- Wilsons – Old Royal Adelaide Hospital Carpark – $10 flat rate wilsonparking.com.au/park/5050_Old-Royal-Adelaide-Hospital-Car-Park_Old-Royal-Adelaide-Hospital-Adelaide
- There are also a number of other car parks available throughout the local area.
- Some street parking is available, however please ensure you pay attention to the parking signs as it is generally 4-hour parking on Frome Road and surrounding streets and you will need to move your car throughout the conference. There is also a kiss-and-drop area on Frome Road (east side, traffic heading into city) so please note the time restrictions or consider getting dropped off!

Cycling

- Adelaide Free Bikes are available from a number of locations – bikesa.asn.au/adelaidefreebikes
- If you are intending to ride, there are bicycle parking spaces located adjacent to the outdoor terrace.

ABHS ground floor



ABHS 1st floor

ABHS 2nd floor

ABHS 3rd floor

Workshop sessions

TIME	SESSION	WORKSHOP	PRESENTER	LEARNING AREA	ROOM
10:55 am	1.01	The Art of Mathematics	John Bament & Vanessa Gorman	design & technology (6–9), ICT (6–9), mathematics (6–9)	1.31
	1.02	CANCELLED ~~Competitive STEM Culture and How to Develop It~~	~~Finn Galindo~~		
	1.03	Promoting Higher Order Thinking (HOT) and Learner Created Knowledge	Stefania Pulford & Naomi Kuchel	mathematics (6–11), science (10–11)	2.21
	1.04	Blurring The Subject Silos But Providing Rigorous Learning Experiences	Caroline Dean	mathematics (6–11), science (6–11)	3.14
	1.05	Adelaide 2040: A Connected Learning for Year 8 STEM	Adelaide Botanic High School team	design & technology (6–9), mathematics (6–9), science (6–9)	1.28
	1.06	Citizen Science, Climate Change and the Capabilities	Bronte Nicholls	science (6–11)	1.29
	1.07	Space: What's Up? CSIRO's Initiatives in Space	Robert Hollow	science (6–11)	2.04
	1.08	Catapults and Sport Science	Tan Sood	design & technology (6–9), mathematics (6–9), science (6–9)	2.05 (lab)
	1.09	STEM Elective for Year 9/10	Swati Salvi	mathematics (9–10), science (9–10)	2.09
	1.10	Science by Dewey	Izzy Blaess, Charlotte Sharrad & Zac Marshall	science (6–9)	2.14
	1.11	Quantifying the Unknown	Leslie Felix	design & technology (6–11), ICT (6–11), mathematics (6–11), science (6–11)	3.15
	1.12D	Renewable Energy: What's New with Wind and Solar? [double session]	Pennie Stoyles	science (6–11)	2.02 (lab)
12:00 pm	2.01	Use Technology in the Mathematics Classroom	Shailey Puri	ICT (6–11), mathematics (6–11), science (6–11)	3.14
	2.02	Introduction to Arduino Programming	Don Eickhoff	design & technology (6–11), ICT (6–11)	2.04
	2.03	Enriching your STEAM Investigations and Motivating Students to Pursue STEM Careers	Jessica Jones	ICT (6–11), mathematiucs (6–11), science (6–11)	Gym
	2.04	CSIRO Australia's best, inspiring Australia's next	Bill Flynn & Sarah McDonnell	design & technology (6–9), ICT (6–9), mathematics (6–9), science (6–11)	1.31
	2.05	Science, Maths and Digital Technologies Programs through UniSA Connect	Anita Trenwith, Julie Tapsall, Mike Hill, Patricia Curtis & Nat Scherer	ICT (6–9), mathematics (6–11), science (6–11), sport science/PE	1.28
	2.06	STEM Physics: Sound and Wave Analysis using Laptops	Paul Gavini	science (6–11)	2.09
	2.07	Keep Cup: Connected Learning with Year 9 STEM	Adelaide Botanic High School team	design & technology (6–9), mathematics (6–9), science (6–9)	2.21
	2.08	Upper Primary Taxonomy and Classification Activities	Karina Darling	science (6–9)	2.05 (lab)
	2.09	Integrating STEM Learning	Katrina Elliott	science (6–9)	3.20
	2.10	Think like a Programmer	Dina Phan	ICT (6–9)	2.14
	2.11	STEM: No Budget... No problem	Mark Divito	science (6–9)	2.13
	2.12D	Renewable Energy: What's New with Wind and Solar? [double session]	Pennie Stoyles	science (6–11)	2.02 (lab)

TIME	SESSION	WORKSHOP	PRESENTER	LEARNING AREA	ROOM
1:50 pm	3.01	Get your Hands-on Linear Growth	Alastair Lupton	mathematics (6–11)	2.21
	3.02	How are Social Skills, the General Capabilities and STEM linked?	Abby MacPherson & Andrew Frazer	design & technology (6–9), ICT (6–9), mathematics (6–9), science (6–9)	2.09
	3.03	Hands-on with Earthquake Engineering	Shane Meegan	design & technology (6–9), ICT (6–9), mathematics (6–9), science (6–9)	1.31
	3.04	STEMfooty – Engaging Students in Learning, using AFL as the Vehicle	Katie Gloede	mathematics (6–9), science (6–9)	1.28
	3.05	Implementing a Science Specialist Program in a Primary School and incorporating STEM Learning	Danielle Pedler	science (6–7))	3.15
	3.06	We're Giving Our Students the PIP (Personal Innovation Project)!	Anthea Ponte & Krystal Lawrie	design & technology (6–9), ICT (6–9), science (6–9)	2.13
	3.07	Improving Students' Problem-solving	Nick Kyriazis	mathematics (6–9)	3.14
	3.08	Incorporating Science as a Human Endeavour into Your Lessons	Izzie Telfer	science (6–11)	2.04
	3.09	Energise Your Classroom	Maria Gonzalez	design & technology (6–11), ICT (6–11), mathematics (6–11), science (6–11)	3.19
	3.10	CANCELLED ~~Teachers Creating Industry–School Partnerships: Highlights from the Teaching for Tomorrow Project~~	~~Stef Sotora~~		
	3.11	A Collaborative Teaching Approach in Middle School Science	Sam Tuffnell & Aija Mee	design & technology (6–9), science (6–9)	2.02 (lab)
	3.12	An EXCELlent Introduction to Hyperbolas	Raiph McPherson	ICT (10–11), mathematics (6–11)	2.14
2:55 pm	4.01	Robotics with Mbots and Curriculum Mapping	Robert Lenkiewicz & Mandeep Kaur	ICT (6–9)	3.15
	4.02	Brain Training Maths Card Games	Richard Korbosky	mathematics (6–11)	3.19
	4.03	What on Earth? Middle-school Mathematics with the Science that Inspires It	Linda Eakin	mathematics (6-11), science (6–11)	3.14
	4.04	Design Challenges in STEM	Hilary Schubert-Jones	science (6–11)	1.31
	4.05	Collaborating with Industry	Michael Murphy	mathematics (6-11), science (6–9)	2.04
	4.06	21st Century Teaching Strategies to Enhance Learning Outcomes for Students	Oanh Kieu Luong & Matt Robinson	mathematics (6-11)	3.20
	4.07	Developing STEM Skills with Escape Rooms	Katelyn Wright	mathematics (6-11), science (10–11)	2.21
	4.08	CANCELLED ~~Critical Numeracy in the Science Classroom~~	~~Hazel Greatbanks~~		
	4.09	Unleashing the Potential of Office 365 and DayMap to Support Learning and Assessment	Theo Papazoglov	design & technology (6–9), mathematics (6–9), science (6–9)	1.28
	4.10	Dissections for Middle School Students	Roger Mills	science (6–9)	2.05 (lab)
	4.11	The G-Suite	Amana Chhokar	ICT (6–9)	2.09
	4.12	Minecraft Education Chemistry Lab	Bec Wouters & Leigh Harder	ICT (6–9), science (6–11)	1.29

Session 1: 10:55–11:55 am

1.01 The Art of Mathematics

John Bament, O'Loughlin College
Vanessa Gorman, St Peters College

- **design & technology (years 6–9)**
- **ICT (years 6–9)**
- **mathematics (years 6–9)**

Delivery drones, autonomous Uber, robotic factories and space exploration are happening now. In this practical, hands-on workshop you will program robotic cars to draw various shapes and solve numerous puzzles. Leave with your own piece of mathematical art and some practical examples of how robotics can be used in your classroom and their application to the Australian Curriculum and the real world. Inspire your students to be the next Elon Musk – or better!

~~1.02 Competitive STEM Culture and How to Develop It~~ CANCELLED

~~Finn Galindo, Marryatville High School~~

- **design & technology (years 6–11)**
- **mathematics (years 6–11)**
- **science (years 6–11)**

How do we enable students to be self-inspired with the competitive opportunities available to them? What leads to self-directed learning and student support networks.
How do we set up spaces for students to own, to grow and to lead in? We will look at the challenges facing you and creating these kinds of spaces, looking at potential avenues for development.
How does industry become part of the picture? from starting small to developing recurrent partnerships.
Potentially some time to look at the 2018 F1 in Schools World Championship from Brighton Secondary School and hear from students on how they got involved and what kept them engaged.

1.03 Promoting Higher Order Thinking (HOT) and Learner Created Knowledge

Stefania Pulford & Naomi Kuchel, Thebarton Senior College

- **mathematics (years 6–11)**
- **science (years 10–11)**

This workshop will offer teachers an opportunity to develop classroom practices that promote higher order thinking (HOT). They will reflect on Bloom and Hattie's effect sizes and will discuss specific techniques that support students making their own connections with content. The session has a strong focus on specific techniques for questioning, problem solving, creating knowledge and facilitating classroom discussions, and provides support to develop activities that promote effective shifts in classroom practice.

1.04 Blurring the Subject Silos but Providing Rigorous Learning Experiences

Caroline Dean, Wirreanda Secondary School

- **mathematics (years 6–11)**
- **science (years 6–11)**

In the hands on part of this workshop make a splat map with a catapult. We explore: how can we use the knowledge of why objects move to make predictions of the future movements of objects? This interdisciplinary task uses mathematics to calibrate and make predictions about the forces involved in catapults.
But why stop at just two subjects? Want to know a bit more about how to plan for interdisciplinary curriculum? This will be a brief taster to how we set up project based learning called 'Symbolise Me'. This project explored the essential question "How am I unique?" Students were able to use symbolism to connect with Science, Maths, English and HASS and presented four portraits at an exhibition of learning.

1.05 Adelaide 2040: A Connected Learning for Year 8 STEM

Adelaide Botanic High School team

- **design & technology (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–9)**

Year 8 students redeveloped Adelaide to meet the challenges we will face in the future around sustainability, urban heat islands and rising sea levels. This workshop looks at the structures, processes and supports that allowed for a connected learning experience for our students across mathematics, science and technologies. We will talk about the processes and planning required to deliver this highly transdisciplinary learning.

1.06 Citizen Science, Climate Change and the Capabilities

Bronte Nicholls, Adelaide Botanic High School

- **science (years 6–11)**

This workshop will explore how students can develop a range of the General Capabilities through involvement in Citizen Science projects and taking their own personal action. Students from Adelaide Botanic High School will take the participants on a tour of the Adelaide Bat Camp, describing how climate change is impacting species distribution in Australia. They will share how they have developed a range of capabilities through their work with others such as workshops for primary school students and working with university researchers.
Participants will have the opportunity to reflect on ways their students could engage with the local community to develop their capabilities.
Please note that this workshop will involve an outdoors walking tour so please ensure that you come prepared with appropriate shoes, sunscreen, hats and water bottles.

Session 1: 10:55–11:55 am

1.07 Space: What's Up? CSIRO's Initiatives in Space

Robert Hollow,
CSIRO Astronomy and Space Science

- **science (years 6–11)**

CSIRO is a major leader in Australian space initiatives. Specific examples including the Space Roadmap, the newly-established Center for Earth Observation, NovaSAR-1, a new radar satellite and the development of CSIROSat-1 due for launch in 2020. CSIRO also provides excellent space tracking and communication through facilities such as the CDSCC operated in conjunction with NASA and the ESA station at New Norcia. We explore these initiatives in detail, highlighting how they can be incorporated into the curriculum. The role of Earth Observation in addressing the UN's Sustainable Development Goals is discussed. Examples of educational resources and activities are presented.

1.08 Catapults and Sport Science

Tan Sood, Playford International College

- **design & technology (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–9)**

Using 21st century pedagogy to create the STEM project that connects science and sport science. The objective of this project was to produce confident, capable and successful learners whilst building their capabilities and modelling learning dispositions using Project Based Learning. The knowledge and skills learnt in the unit of science and math can be transferred to the game of basketball. Specifically, applying the laws of flight and angles that students learned in the Catapult project to the game of Basketball.

1.09 STEM Elective for Year 9/10

Swati Salvi, St Martin's Lutheran College

- **mathematics (years 9–10)**
- **science (years 9–10)**

In this presentation, I will share the unit plan and resources used in this elective as well as student feedback. I will be bringing student work and pictures.
We will explore some YouTube channels and the Microsoft STEM library to develop an understanding of the challenges faced by students and how this unit can be incorporated in different school settings.

1.10 Science by Dewey

Izzy Blaess, Charlotte Sharrad & Zac Marshall, Reynella East College

- **science (years 6–9)**

This session will highlight different hands on projects students have completed this year in Science surrounding sustainability.
Some tasks include; "designing and building sustainable tiny homes", "trash tag challenge" and "school rubbish predictions".

1.11 Quantifying the Unknown

Leslie Felix, Metrology Society of Australasia

- **design & technology (years 6–11)**
- **ICT (years 6–11)**
- **mathematics (years 6–11)**
- **science (years 6–11)**

Exploring the unknown. A look at uncertainty in measurement with a practical demonstration, to engender a joint effort from the audience that can be taken back to the class room with help from donated aid kits. Explore the mathematics and effects of metrology on our daily lives.

1.12D Renewable Energy: What's New with Wind and Solar? [double session]

Pennie Stoyles, Australian Academy of Technology and Engineering

- **science (years 6–11)**

Secondary students often consider that science lacks relevance for the everyday world. At the same time, evidence suggests that students are concerned about global warming and climate change. The STELR Renewable Energy program is a national science program developed by the Australian Academy of Technology and Engineering, which uses the relevance of global warming issues to inspire students into inquiry-based learning in the physical sciences using the context of renewable electricity generation. This hands-on workshop focuses on the updated STELR resources and information about advances in wind and solar energy as well as battery storage technologies.

Session 2: 12:00–1:00 pm

2.01 Use Technology in Mathematics Classroom

Shailey Puri, One School Global Adelaide

- **ICT (years 6–11)**
- **mathematics (years 6–11)**
- **science (years 6–11)**

This session focuses on the use of technology in the mathematics classroom by using Microsoft tools, such as one note, excel, forms and word. How with the help of immersive reader we can help kids with reading difficulties who can be excellent mathematicians? How can Math teachers use word doc efficiently to make tests and save time? This session will also aim to introduce Panopto as a flipped learning classroom tool. These tools have been currently in use in an online learning environment at our school.
These are no additional tools but these are time efficient and effective in managing engaged classroom.

2.02 Introduction to Arduino Programming

Don Eickhoff, Techspace Learning Inc.

- **design & technology (years 6–11)**
- **ICT (years 6–11)**

This hands-on workshop will show participants how to write programs for the Arduino microprocessor using Ardublock, a "drag and drop" interface. Absolutely no experience is required as the workshop is delivered with real world explanations devoid of "jargon". Participants will receive a demonstration of one way to engage a classroom of inexperienced programmers, and to demystify communication with the digital world.

2.03 Enriching your STEAM Investigations and Motivating Students to Pursue STEM Careers

Jessica Jones, Inspire STEM Education

- **ICT (years 6–11)**
- **science (years 6–11)**
- **mathematics (years 6–9)**

This workshop gives practical examples of STEAM investigations that have successfully been utilised with students from various school sites using a research grade Scanning Electron Microscope (SEM) as part of the Inspire STEM Outreach initiative launched in Adelaide last year. The workshop will address how SEM effectively supports career awareness raising and STEM career engagement and motivation. Participants will be given the opportunity to operate the instrument directly and get a sense of the possibilities as well as how simple and intuitive this research grade equipment actually is to operate. Come and see why this initiative is so important and easy for all students to access.

2.04 CSIRO: Australia's Best, Inspiring Australia's Next

Bill Flynn & Sarah McDonnell, CSIRO Education and Outreach

- **design & technology (years 6–9)**
- **ICT (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–11)**

At CSIRO, we're passionate about the power of STEM to unlock a better future for all Australians. For more than 40 years, we have been developing and delivering high-quality STEM education programs designed to bring real science to life in our classrooms and communities. In this session you will hear about some of the programs available to teachers all linked to the Australian Curriculum and using best practice STEM teaching methods. From a short research project alongside a CSIRO researcher to a five-day immersive STEM experience, these are just two of the many programs CSIRO offer to teachers. The session will also include a selection of practical activities contained in the classroom resources.

2.05 Science, Maths and Digital Technologies Programs through UniSA Connect

Anita Trenwith, Julie Tapsall, Mike Hill, Patricia Curtis & Nat Scherer, University of South Australia

- **ICT (years 6–9)**
- **mathematics (years 6-11)**
- **science (years 6–11),**
- **sport science/PE**

UniSA Connect will demonstrate and discuss their range of STEM programs. These hands on inquiry based activities are available for teachers and students to access and will support and enrich your schools STEM learning focus. There will also be on opportunity to learn about the UniSA Connect networking and National programs that your school could participate in for 2020.

2.06 STEM Physics: Sound and Wave Analysis using Laptops

Paul Gavini, Underdale High School

- **science (years 6–11)**

Using the SoundCard Oscilloscope software, I will be demonstrating how student laptops can be converted to an oscilloscope, spectrum analyser and stereo frequency generator to conduct formative and summative practicals. A design practical for stage 1 Physics will be presented.

Session 2: 12:00–1:00 pm

2.07 Keep Cup: Connected Learning in Year 9 STEM

Adelaide Botanic High School team

- **design & technology (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–9)**

This workshop will share how our year 9 students designed and prototyped a reusable keep cup for ABHS. In a connected learning experience students investigated the best materials, sizes and designs for the optimum keep cup. We will talk about the processes and planning that underpinned the delivery of this highly transdisciplinary learning.

2.08 Upper Primary Taxonomy and Classification Activities

Karina Darling, Risdon Park Primary School

- **science (years 6–9)**

This workshop will take a look at classification and taxonomy at the upper primary/lower secondary level. Participants will work through a learning sequence that has been used in a classroom successfully. This session includes 4–5 activities and a project to engage, challenge and assess learning across the Biological Sciences in years 6–8. Participants will be given copies of activities to take with them, as well as a unit outline.

2.09 Integrating STEM Learning

Katrina Elliott, Department for Education

- **science (years 6–9)**

In this seminar we will share the findings of the year 7 and 8 STEM Collaborative Inquiry Research to highlight some best practice for integrating STEM learning in your school.

2.10 Think like a Programmer

Dina Phan, Woodville High School

- **ICT (years 6–9)**

This workshop is aimed at beginning teachers, and teachers new to Digital Technology. We will explore a range of hands-on activities that can be used to introduce coding in a fun, engaging way. Participants will be required to work in small groups.

A WiFi enabled device is desirable, but not necessary.

2.11 STEM: No Budget... No problem

Mark Divito,
Adelaide Secondary School of English

- **science (years 6–9)**

All schools have an abundance of one resource: scrap paper. This workshop will show simple fun STEM activities and demonstrations utilising scrap paper. Introduce fair testing with paper tricks. Teach Physics and Chemistry concepts with paper. If you thought STEM activities with pasta were cheap then try this workshop with paper! The presenter currently teaches middle school science and maths to refugees and immigrants in the department's high school for new arrival students.

2.12D Renewable Energy: What's New with Wind and Solar? [double session]

Pennie Stoyles, Australian Academy of Technology and Engineering

- **science (years 6–11)**

Secondary students often consider that science lacks relevance for the everyday world. At the same time, evidence suggests that students are concerned about global warming and climate change. The STELR Renewable Energy program is a national science program developed by the Australian Academy of Technology and Engineering, which uses the relevance of global warming issues to inspire students into inquiry-based learning in the physical sciences using the context of renewable electricity generation. This hands-on workshop focuses on the updated STELR resources and information about advances in wind and solar energy as well as battery storage technologies.

Session 3: 1:50–2:50 pm

3.01 Get your Hands-on Linear Growth

Alastair Lupton, Le Fevre High School

- **mathematics (years 6–9)**
- **mathematics (years 6–11)**

If you haven't already, you should get your hands on a Cup Snake – an engaging introduction to and surprisingly powerful way to think about linear growth, regression and mathematical modelling. It is one of my favourite lessons in Year 9 or 10 and I am looking forward to sharing it with you.

3.02 How are Social Skills, the General Capabilities and STEM Linked?

Abby MacPherson & Andrew Frazer, Burnside Primary School

- **design & technology (years 6–9)**
- **ICT (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–9)**

In this workshop, through practical approaches, participants will:

- discover the growing importance of social skills in the work place
- build teacher capacity to plan for trans-disciplinary approaches to STEM task design with the goal of keeping the upper primary and early secondary years collaboratively working and communicating.

3.03 Hands-on with Earthquake Engineering

Shane Meegan, Seymour College

- **design & technology (years 6–9)**
- **ICT (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–9)**

This workshop explains the process used to take earthquake theory off the page and put it in the hands of students, as they compete in teams to engineer their best attempt at an earthquake proof-building. Groups each assume the role of an engineering firm, competing for a contract to build in a high seismic activity area, and presenting their creations to a judging panel at the end of the process. This task has assessable outcomes related to Maths, Science, Design and Technology, ICT and more. It is best suited to Middle School classes but could be adapted for either junior or senior lessons. You will be given a range of practical ideas, which can be applied in the classroom either in part, or as a whole program.

3.04 STEMfooty – Engaging Students in Learning using AFL as the Vehicle

Katie Gloede, Adelaide Football Club

- **mathematics (years 6–9)**
- **science (years 6–9)**

STEMfooty is designed to translate Australian kids' love of AFL into an appreciation, understanding, and passion for the science and mathematics underlying the sport. By demonstrating the natural connection between sport, science, and mathematics, students are encouraged to define and pursue better life choices, including the continuation of their education. For those students for whom book-based learning is challenging, the program offers valuable approaches to engage in body-based learning.

During this session you will be introduced into the history, development and pedagogy of the STEMfooty program and Adelaide Football Club's leadership in this initiative. You will also get valuable information on how to be involved in 2020.

3.05 Implementing a Science Specialist Program in a Primary School and Incorporating STEM Learning

Danielle Pedler, Whitefriars Catholic School

- **science (6–7)**

After spending two years working in middle years science in short contracts throughout Adelaide, I discovered a distinct lack of enthusiasm and positive attitude towards science in the students I encountered; perhaps resulting from a lack of understanding rather than a disliking of Science itself. My objective this year, and moving forwards, is to instil the love and passion I have for Science in students from their early years of schooling. I will share with you the challenges and rewards of setting up a primary Science specialist program and coordinating STEM in a large primary school.

3.06 We're Giving Our Students the PIP (Personal Innovation Project)!

Anthea Ponte, Hawthorndene Primary School
Krystal Lawrie, Department for Education

- **design & technology (years 6–9)**
- **ICT (years 6–9)**
- **science (years 6–9)**

Using the design thinking process, we have embarked on a Personal Innovation Project (PIP) with our students. Students were challenged to identify a problem or issue that was personally significant to them and design their own unique innovative solution to the problem. Using the 6D model to present our innovation intervention (PIP) we will share our planning, implementation and review processes. We will also share the strengths and weaknesses of the PIP we have recognised as we mentored our students through this authentic learning opportunity. The resources used throughout the PIP will be available in digital format for participants to modify and adapt for their own classrooms.

Session 3: 1:50–2:50 pm

3.07 Improving Students' Problem-Solving

Nick Kyriazis, Le Fevre High School

- **mathematics (years 6–9)**

Problem-solving. It is a proficiency strand in mathematics, key to science inquiry skills and inherent in the design cycle, but how do we actually teach it? How do we grow the STEM problem-solvers that the future will sorely need? Through a novel idea, taking the approach that a research mathematician takes when faced with a problem, we believe that the skills required to problem-solve (how to get started, question, be systematic, communicate, extend...) can be taught. This hands-on workshop will feature problems that are accessible, open, extendable and suitable for upper primary or lower secondary mathematicians, but the approach can be applied at all levels.

3.08 Incorporating Science as a Human Endeavour into Your Lessons

Izzie Telfer, Stile Education

- **science (years 6–11)**

It can be hard incorporating SHE activities into a jam-packed curriculum. Stile has done the hard work for you by producing high-quality units that include links to up-to-date, relevant scientific endeavours. Come along to get some examples and resources to take back to your classroom!
Please bring a device along to this session.

3.09 Energise Your Classroom

Maria Gonzalez, Society of Petroleum Engineers

- **design & technology (years 6–11)**
- **ICT (years 6–11)**
- **mathematics (years 6–11)**
- **science (years 6–11)**

The Society of Petroleum Engineers of South Australia (SPE-SA) promote and support the teaching of STEM-based learning in school, and foster the professional development of STEM educators.
This workshop will incorporate hands-on activities to engage STEM teachers and allow them to learn about some of the important science behind the petroleum industry with links to the relevant curriculum areas (e.g., Maths, Physics or Science). Ready to go, lesson plans and activities will be provided to teachers to implement in their classroom.

~~3.10 Teachers Creating Industry–School Partnerships: Highlights from the Teaching for Tomorrow Project~~ CANCELLED

Stef Sotora, Elizabeth East Primary School

- **design & technology (years 6–11)**
- **ICT (years 6–11)**
- **mathematics (years 6–11)**
- **science (years 6–11)**

Connecting schools to industry can provide a basis for contextual STEM learning but teachers can be reluctant to engage with industry despite both parties welcoming such links. The Teaching for Tomorrow (TfT) project is undertaken by pre-service high school teachers in which they are placed with industry to create a STEM unit of work based on a real-life working problem. TfT aims to upskill them in experiencing STEM in context with an industry partner, so those skills can be transferred to their teaching practices upon graduation. This workshop showcases findings from TfT graduates and highlights factors that inhibit and enable school–industry partnerships.

3.11 A Collaborative Teaching Approach in Middle School Science

Sam Tuffnell & Aija Mee, Woodville High School

- **design & technology (years 6–9)**
- **science (years 6–9)**

This workshop demonstrates a Year 8 Physical Science unit collaboratively designed and delivered in order to make effective use of the STEM learning space at Woodville High School. Participants will partake in the student experience of a practical teaching and learning challenge element of this unit, which covers energy transfers and transformations and also addresses the theme of Sustainability. The workshop will give an overview of the unit content and assessment tasks, the collaborative planning and design process as used at Woodville High School, and student engagement with this teaching and learning pedagogy.

3.12 An EXCELlent Introduction to Hyperbolas

Raiph McPherson, Seaton High School

- **ICT (years 10–11)**
- **mathematics (years 6–11)**

Microsoft Excel is arguably the most under-utilised software package in our schools. This practical workshop will introduce participants to Excel's ROW() and COLUMN() operations as well as conditional formatting. The broad and transferable ICT skills developed will be applied to demonstrate an innovative approach to teaching hyperbolas, inspired by Chris Wetherell's AAMT Conference keynote in 2017.
Participants should bring laptops with a desktop edition of Microsoft Excel installed. A basic understanding of Excel and inputting functions is assumed.

Session 4: 2:55–3:55 pm

4.01 Robotics with Mbots and Curriculum Mapping

Robert Lenkiewicz & Mandeep Kaur, Parafield Gardens High School

- **ICT (years 6–9)**

We would like to share our ICT success , curriculum mapping and some activities that we run with Year 8s and STEM transition for upper primary using Mbots. They will be of most relevance to upper primary and lower high school teachers.

4.02 Brain Training Maths Card Games

Richard Korbosky, Dualoh Pty Ltd

- **mathematics (years 6–11)**
- **commercial**

Get your students excited to learn, think and communicate mathematically with DUALOH! maths brain training card games. Each of the games which focus on whole number, fractions, decimals and percentage, are enjoyable, challenging and adaptable to different abilities and adapted to focus on ordering, addition, subtraction and multiplication. Come along to see how you get students to practise basic facts, focus on mathematical language, develop flexible and mental thinking strategies and most of all see mathematical concepts in a variety of ways and get the brain thinking in different ways.

4.03 What on Earth? Middle-school Mathematics with the Science that Inspires It

Linda Eakin, Thebarton Senior College

- **mathematics (years 6–11)**
- **science (years 6–11)**

Come and try middle-school mathematics together with the science that inspires and uses it. Take away ideas and resources to apply in your own STEM classrooms.
Linda Eakin is an enthusiastic educator, drawing on her electronic engineering career in defence, space and telecommunications to teach secondary school STEM. Linda's mathematics classes range from middle-school Essentials to SACE Stage 2 Methods and Specialist at Thebarton Senior College (TSC). Across all levels of learning, Linda is passionate about integrating the science that inspires and applies the mathematics. This philosophy is core to TSC's Mathematics Academy (www.tsc.sa.edu.au/mathematics-academy) for Year 10–12 students.

4.04 Design Challenges in STEM

Hilary Schubert-Jones, Royal Institution of Australia

- **science (years 6–11)**

Design challenges can be integrated in to almost any science content outcome and can be adapted to suit the needs of all learners. They can be easily made to integrate the T, E and M into STEM whilst putting the learning in to an engaging real-life context.
This workshop will give you some inspiration on the types of design challenges that cover the Australian National Curriculum and can be done in a science classroom. You will get some hints and tips about sneaking in some maths and career information as well as advice about how to differentiate it to suit all learners. Finally, you will discover how it can be used to formatively assess the learning and the types of thinking that occurs within the classroom.

4.05 Collaborating with Industry

Michael Murphy, CESA

- **mathematics (years 6-11)**
- **science (years 6–9)**

In this session, the two presenters, one a teacher and the other a data architect from the Plant Accelerator at the University of Adelaide, explain and explore how they collaborate to create learning for students. Attendees will be able to take away the process that the pair used, as well as an authentic learning task involving the mathematics of plant health that was co-created to apply mathematical thinking of a professional within a mathematics, science or integrated classroom.

4.06 21st Century Teaching Strategies to Enhance Learning Outcomes for Students

Oanh Kieu Luong & Matt Robinson, Marden Senior College

- **mathematics (years 6–11)**

Maths is often regarded as a subject which many students can not relate to, thus engage in. This workshop will look at a range of ways in which we have used hands on activities and technology as a powerful tool to enhance student engagement and learning outcomes. There will be demonstrations of a range of activities and tools that participants can interact with, which can be applied in teaching year 8 to 11 Maths subjects.
Teachers are encouraged to bring their own laptops/devices.

Session 4: 2:55–3:55 pm

4.07 Developing STEM Skills with Escape Rooms

Katelyn Wright, Edward John Eyre High School

- **mathematics (years 6–11)**
- **science (years 10–11)**

Collaboration, analysis/evaluation, creating, problem-solving, and critical and creative thinking: How do we encourage students to use and develop these skills in the school context? This session will contain 3 parts:

1. What do student developed escape rooms look like?
2. How do I use the escape room concept as a learning/ revision task in science and maths subjects?
3. How can you use the escape room concept in your own classroom?

Through this session you will experience parts of a student developed escape room for yourself, and you will have the opportunity to develop an activity that uses escape room concepts for your own classroom context.

~~4.08 Critical Numeracy in the Science Classroom~~ CANCELLED

~~*Hazel Greatbanks, Riverton & District High School*~~

- **science (years 6–9)**

Many reports emphasise the importance of STEM subjects, yet the number of students studying these subjects in senior school is in decline. In the current social, economic, political and environmental climates, the need for numerate and scientifically literate members of society is difficult to underestimate.
Through teaching aspects of the science curriculum within a framework of social justice and, with a focus on critical numeracy, we have the opportunity to increase the engagement of students and numbers of students studying STEM subjects in the senior years and post school.
The workshop will present a teaching resource for middle school science which I have developed for the Project in Education as part of a Master of Education course.

4.09 Unleashing the Potential of Office 365 and DayMap to Support Learning and Assessment

Theo Papazoglov, Adelaide Botanic High School

- **design & technology (years 6–9)**
- **mathematics (years 6–9)**
- **science (years 6–9)**

This workshop will explore practical ways the Office 365 suite can support personalised learning and assessment for students. This will include formative assessment strategies including instantaneous feedback, supporting literacy and numeracy development. We will unlock secrets, hiding in plain site that will instantly change your pedagogy.

4.10 Dissections for Middle School Students

Roger Mills, St Peter's Girls' School

- **science (years 6–9)**

There are a number of dissections that we perform at St Peters Girls as part of our Middle School curriculum to enhance student engagement and understanding of content. In this workshop, participants will take part in dissections aimed at year 7 and 8 students. These will include a comparative dissection of a Chordate, Mollusc and Arthropod that is performed as part of taxonomy in year 7, and a Pluck dissection performed as part of the year 8 Body Systems unit of work. Participants will be guided through these dissections to gain confidence in delivering them as either a demonstration or a class activity.

4.11 The G-Suite

Amana Chhokar, John Pirie Secondary School

- **ICT (years 6–9)**

This session will provide opportunities to explore some features of the Google suite- Google classroom for flipped classroom, Google docs voice typing and Read Aloud features for students with additional needs for them to be able to type with their voice and get the browser read the text for them, and Google Drawings for creativity and collaboration. This workshop will be useful particularly for teachers who work at multiple sites by setting up google classrooms, differentiating their teaching and providing opportunities for students to work collaboratively.
Please bring a device with Chrome browser installed.

4.12 Minecraft Education Chemistry Lab

Bec Wouters & Leigh Harder, Ocean View College

- **ICT (years 6–9)**
- **science (years 6–11)**

Minecraft is a sandbox open world game. With the release of the Education Edition (and with all DfE schools having access to this via LearnLink logins), this has opened up a whole new opportunity for learning through simulation (and it's free!). The Chemistry Update for Minecraft: Education Edition offers exciting new tools to
explore the world of chemistry in Minecraft. The Chemistry Resource Pack allows you and your students to conduct experiments within Minecraft that simulate real world science. This session will be an introduction to this, and give educators an opportunity to play with this resource. No gaming or Minecraft experience required!
Attendees are recommended to bring a device with Minecraft EE installed and a mouse, however some devices will be available to share on the day.

Trade display