

It Takes a Spark!

Clough EDU Conference

Tuesday, 7 December 2021 | PERTH

2021 Theme: Building our future through STEAM

The intent of the It Takes a Spark EDU Conference is to bring together Students (Year 4 to 10) and Teachers to connect with inspiring industry role models, share their current school based activities and projects using an authentic sharing and experiential model, create networks of teachers and student teams, and solve social justice design challenges.

Teacher PD workshops from leading STEAM experts, teachers and students on topics as diverse as

- >> Cyber Teacher - Starting Up in Cyber Security
- >> Using Big Data with real data sets across STEM areas
- >> Using enterprise skills to improve your students' financial capability
- >> Leading STEM Inquiries in non-traditional STEM areas
- >> STEAMPunk Adventures – Take your students on a tailored journey around the world!
- >> Drones and Robots - STEM Education can be more fun!

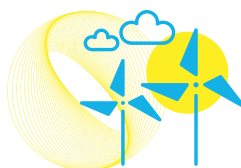
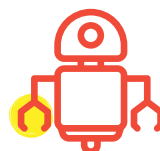
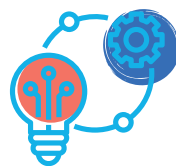
Hands-on sessions for students and teachers, examples

- >> The Secret Science of Cryptography
- >> Beacy Does Science Week
- >> LOTE language explorers with VRTY
- >> AI and automation with DOBOT Magician Lite
- >> Arduino in the Classroom
- >> Virtual Reality: Beyond the Headset
- >> Solving Real-World Problems using Drones
- >> A scientific investigation into UV light exposure on human skin
- >> VR Mini Theatre
- >> Going Bush with STEM Learning
- >> CSI: Fingerprinting

Plus Problem Solvers Sessions, including...

- >> Small Scale Renewable Energy
- >> A Very STEM-y Christmas
- >> Picture Book Engineering
- >> Batteries in Recycling Challenge
- >> What is a Game?

plus many more...



Outstanding Keynote Speakers



DR RINA FU

Scientist, singer-songwriter, and author-illustrator

Since migrating from the concrete squeeze of Hong Kong to idyllic Perth as a ten year old, Rina has grown into a colourful composite of scientist, singer-songwriter, and author-illustrator. Rina pursued a medical science career firstly in a pathology lab and then as a graduate student. Her doctorate on malaria drug resistance included various field trips to PNG and earned her the prestigious JFA-Sprent Medal from the Australian Society of Parasitology. She earns accolades as a teaching academic for her innovations as an instructor – testament to her enthusiastic and engaging style of science communication. She is the author of a picture storybook 'My Mad Scientist Mummy' and recently launched the medical science cartoon animation MicroToons!



DR SABINE BELLSTEDT

International Centre for Radio Astronomy Research University of Western Australia, Superstar of STEM

Dr Sabine Bellstedt is an astronomer at the International Centre for Radio Astronomy Research. Her love for physics arose from a desire to understand the world around her – from the quirks of the natural world (like why bubbles are coloured like rainbows), to the scientific basis of the technological world around her (like the photoelectric effect that makes solar panels work). For Sabine, the most awe-inspiring aspect of physics is astrophysics. As an astronomer, she now uses some of the biggest telescopes in the world to work in the field of galaxy evolution. In addition to astronomy, Sabine is passionate about the environment, and trying to reduce her environmental footprint.

MORE INFORMATION: <https://spark-educonferences.com.au/it-takes-a-spark-2021-perth/>

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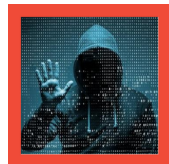


St Hilda's
ANGLICAN SCHOOL FOR GIRLS

TEACHER MINI MASTERCLASS: PRACTICAL PROFESSIONAL DEVELOPMENT

Cyber Teacher - Starting Up in Cyber Security

Tim Edwards, LifeJourney and Donna Buckley, John Curtin College of the Arts



Cybersecurity has become a have-to-know topic in the world. Mainly this is due to the increasing cyberattacks that are occurring to individuals, businesses and governments.

Tim Edwards and Donna Buckley will be sharing their expertise so teachers can effectively communicate to students about cyber security topics and facilitate student learning programs in the classroom. Tim will share information about the Cyber Teacher professional development program and other resources from LifeJourney. Donna Buckley will share her journey as a Cyber Teacher and the development of a Certificate II in Workplace Skills with a Cybersecurity context to John Curtin College. Teachers will walk away with a baseline understanding of the cyber security ecosystem in Australia, and be equipped with classroom-ready curriculum and resources to teach students.

School / teacher stages: Beginner, Next Step & Extending
Suitable for Secondary Teacher

Using enterprise skills to improve your students' financial capability

Lacey Filipich, Money School



A project-based enterprise experience can be a 'silver bullet' in our quest to improve student financial capability. In this workshop, Lacey will show you how an enterprise project can teach students about money while hitting curriculum metrics for Years 5 to 8 in HASS (Economics & Business stream) and Mathematics (Financial Maths stream) as well as several General Capabilities. She will also give you two strategies for implementing such experiences in the classroom.

School / teacher stages: Beginner
Suitable for Year 5 to 8 Teacher

Leading STEM Inquiries in non-traditional STEM areas

Hayden Brown, Judith Lawrence and students, Halls Head College and Western Australia Holocaust Institute



One of the challenges of the STEM acronym is how it can be seen to exclude other curriculum areas. Yet the processes and thinking frameworks underlying STEM are applicable in all disciplines.

This teacher mini-masterclass will step teachers through the STEM inquiry process that the Halls Head College students followed to turn their Year 11 Historical inquiry into an immersive experience. By integrating the STEM inquiry model the students were able to do the work of Historians while modelling a best practice STEM inquiry project. In addition, the students designed their Holocaust Inquiry project using the PICRAT matrix to help guide VR technology integration. This provided them with a way of meaningfully thinking about technology integration that is equally applicable in all non-traditional STEM classes. Teachers will be able to view student created VR resources and discuss how they could follow the same process to have students create VR resources for any curriculum area.

School / teacher stages: Beginner, Next Step & Extending
Suitable for Secondary Teacher

Using Big Data with real data sets across STEM areas

Marianne Beattie and Samantha Rees, All Saints' College



A group of STEM teachers (from across different education sectors) have worked in partnership with Pawsey Supercomputing Centre to create a set of easy to use resources for STEM area teachers. The resources are aimed at Year 10 students but can be differentiated for other year levels. This workshop will walk teachers through the resources, activity and assessment ideas. These resources allow students to be part of creating an international data set based on sleeping and device use (two favourite past times of teenagers). The data set can then be used in various ways across all STEM areas.

School / teacher stages: Beginner, Next Step
Suitable for Secondary Teacher

STEAMPunk Adventures – Take your students on a tailored journey around the world!

Gry Stene, STEAM Engine Global



Discover how you can use elements of the STEAMPunk movement to provide differentiated, curriculum-linked, integrated learning without the extra work. Incorporating Design Thinking, PBL and Inquiry Based Learning and real-life examples, this session demonstrates how you can use the STEAMPunk adventures framework in your classroom to raise awareness and interest in STEM through a fun and engaging journey of discovering the world. Injecting Arts and Humanities into STEM to create the STEAM required to power our future. The program framework helps build skills, confidence, shared language, collaborative relationships and entrepreneurial mindsets, and is particularly effective for girls.

School / teacher stages: Beginner, Next Step
Suitable for Primary and Secondary Teacher

Drones and Robots - STEM Education can be more fun!

Richard Zhang & Anita Cheng, AIZONE & AICODE



Do you find that the options for teaching programming are very limited? Do you find it difficult to create authentic real-world STEM learning that is engaging for your students?

In this teacher session Aizone & Aicode will showcase how DJI drones and robots have been integrated into technology lessons and make the learning engaging, energetic, and full of laughter. The practical applications in our STEM programs are aligned with Western Australia curriculum framework and could make teaching and learning easier.

School / teacher stages: Beginner, Next Step & Extending
Suitable for Primary and Secondary Teacher

DIGIDESIGN MINI-WORKSHOPS - Students and Teachers

The Secret Science of Cryptography - Primary

Donna Buckley and students, John Curtin College of the Arts



The battle between code makers and code breakers goes back thousands of years and is of even greater importance to the security of information in our technological age. In this workshop you learn the basics of cryptography and will apply deciphering techniques to crack secret messages. This workshop will provide students with the foundational knowledge and skills that could lead them to a career in cybersecurity

Suitable for Year 4 to 6 students and/or teacher

The Secret Science of Cryptography - Secondary

Donna Buckley and students, John Curtin College of the Arts



The battle between code makers and code breakers goes back thousands of years and is of even greater importance to the security of information in our technological age. In this workshop you learn the basics of cryptography and will apply deciphering techniques to crack secret messages. This workshop will provide students with the foundational knowledge and skills that could lead them to a career in cybersecurity.

Suitable for Year 7 to 10 students and/or teacher

Beacy Does Science Week

Students from Beaconsfield Primary School

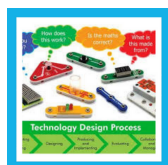


Every year Beaconsfield Primary School creates an amazing Science Week by using set elements to meet school and community expectations and goals. In this exciting and engaging workshop, the students from Beacy will share how they do it. Attendees will then be guided by the student presenters in a mini science tabloid event with three rotations modelled off the longer sessions that occur at the school. These simple science experiments will be fun to repeat at home and the teacher hand out will help teachers (or students!) to plan their own events in future.

Suitable for Year 4 to 6 students and/or teacher

STEM: From school to the real world

Nick Coplin, KodeKlix



Have you ever wondered ...

- How does my automatic night light work?
- How does my TV remote change channels?
- How does the reversing sensor on my family car know when to beep?
- How does a volume knob turn my music up and down?
- How does a solar light know when to come on?
- How does an air conditioner know when to turn off?
- How does a electric fan change speeds?

Presented by Nick Coplin, an engineer, innovator, and parent, this workshop will take teachers and students through the technology design process to understand how things work in the real world. The workshop will also give you a chance to have a hands experience with the amazing KodeKlix kit and resources.

Suitable for Year 5 to 8 students and/or teacher

LOTE language explorers with VRTY

Hayden Brown and Kingston Lee, Halls Head College and VRTY



Learning a language has never been more interesting or engaging! Halls Head College partnered with VRTY to be the first school in WA to align VR/360° capabilities into the LOTE learning curriculum. This allowed students to virtually explore language experiences and be challenged through choose-your-own stories and interactive quizzes. Students were also able to create their own VR/360° experiences using the VRTY platform, employing design thinking and responding to inquiry-based challenges.

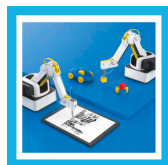
In this workshop attendees will be able to carry out the choose your own adventure style language acquisition activities

1. Lost in the City
2. Japan Tour

Suitable for Year 4 to 10 students and/or teacher

AI and automation with DOBOT Magician Lite

Dr Fincy Patrick, Marwa El-Ayashy and Year 7 students, Al-Ameen College



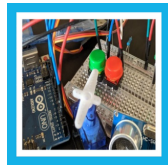
Automation has been described as one of the greatest disruptions of our time, and by 2025, the time spent on current tasks at work by humans and machines will be equal. Equally Artificial Intelligence (AI) and machine learning is beginning to have a large impact on the way our society operates – think SIRI, face recognition, and license plate readers.

In this session attendees will work as a team to apply design thinking, 21st century skills, and programming to solve real-world problems using the Dobot Magician Lite. Along the way you will learn about the power of AI and automation.

Suitable for Year 5 to 8 students and/or teacher

Arduino in the Classroom

Year 6 students & Sheree Pudney, CSIRO STEM Professionals in Schools Partner, St Hilda's Anglican School for Girls



Arduino is an easy to use electronics platform. Year 6 students have been building and experimenting with Arduino circuits as part of their STEAM classes. They will introduce you to the Arduino and help you build and code simple circuits that we use in our everyday lives.

Suitable for Year 5 to 8 students and/or teacher

Solving Real-World Problems using Drones

Darryl Hunt, Rivervale Primary School



Participants will be presented with a real-life problem that they will solve using drone coding. Working together, the problem will become more complex, while the coded solution will become more elegant. At the end, a drone will fly the code to prove that the solution is viable.

Suitable for Year 4 to 7 students and/or teacher

Mystery Box

Karen Donnelly and students, St Hilda's Anglican School for Girls



Participants will work in teams of three to solve a real life problem using only the items in the Mystery Box. In a race against time, each team will work together to program a robot and use design and engineering skills in a rescue scenario.

Suitable for Year 4 to 6 students and/or teacher

DIGIDESIGN MINI-WORKSHOPS - Students and Teachers

Virtual Reality: Beyond the Headset

Kay Hargreaves, Women In Technology WA

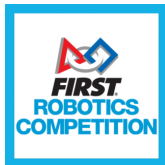


Virtual Reality (VR) is an exciting technology development, and one that is predicted to have a huge impact on future jobs. Women in Technology WA have developed an online learning module (LMS), and an activity component within their Techtrails schools incursions that explores how this technology is changing our world. In this hands-on workshop, you will get a chance to explore a virtual Plant Cell world using Oculus Quest VR headsets and participate in a discussion around how this technology will be utilised now and into the future. With a focus on Future Skills this workshop will explore what skills are needed for a career in VR, the types of roles available in the extended reality industry, and how STEM subjects can open doors to future opportunities for your students.

Suitable for Year 7 to 10 students and/or teacher

WA Robotics Clubs (WRC) Hands-On Workshop

WA Robotics Club, Cecil Andrews College



Staff and students from WA Robotics Clubs schools will provide interactive demonstrations of the 4 FIRST Robotics Programs they participate in. A short presentation will explain the FIRST and ARC Missions and competitions in WA, Australia and Worldwide and promote participation for high level STEM Learning. Students will present an FLL Innovation Project as part of the presentation. The remaining time will provide an interactive opportunity for participants to have a go at the activities.

Suitable for Year 4 to 10 students and/or teacher

What parachute materials allows for the longest flight? (Primary)

Kristina Hicks, iFly Australia



Parachutes have been used to deliver supplies and cargo, save lives, decelerate aircraft, and more recently, for the sport of skydiving. The simple concept of increasing air resistance has evolved into a masterful invention that can be steered and manipulated almost like an airplane, just by using lift, drag, and gravity. In this workshop, attendees will be involved in a hands-on activity to solve the real-world problem of designing and creating a parachute to obtain the longest descent time.

Suitable for Year 4 to 6 students and/or teacher

Investigating Terminal Velocity with a Skydiving Wind Tunnel (Secondary)

Kristina Hicks, iFly Australia



Wind tunnels are used to test a variety of materials and objects ability to withstand high wind-speed conditions. The simple concept of increasing air resistance has evolved into a masterful invention that can be steered and manipulated almost like an aeroplane, just by using lift, drag, and gravity. In this workshop, attendees will be involved in a hands-on activity to solve a real-world problem of calculating and predicting an objects terminal velocity and behaviour in a wind tunnel.

Suitable for Year 7 to 10 students and/or teacher

Exploring Ocean Science

Sarah Curran Ragan, Little Genius Science



As ocean health declines, marine science becomes increasingly reliant on technology to explore and protect our natural resources. Engaging the wider community with ocean health can be a challenge, it often has little relevance to everyday life and experience. This workshop will showcase how Remote Operated Vehicles (ROVs) and their role in exploration and discovery can be used to inspire our next generation of tech savvy marine scientists.

Suitable for Year 6 to 9 students and/or teacher

Penguin Task Force Adventure

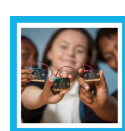
Andy Tan and Bronwin Vowles, St Hilda's Anglican School for Girls



Penguin Island is home to a colony of approximately 1200 little penguins, the largest population of the birds in Western Australia. The little penguin population which breeds on Penguin Island is genetically distinct and in decline. Penguins have been observed taking longer foraging trips leading to chick malnutrition and starvation. Prey depletion and climate change are considered to be major pressures on the breeding population. In this workshop attendees will work in small teams using digital technology to solve a series of environmental problems on Penguin Island.

Suitable for Year 4 to 6 students and/or teacher

STEAM EXPO: hands-on activity area - Student and / or Teacher (5 to 15 min activities)

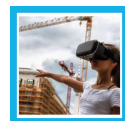


Micro:bits Showcase

Seema Shorey and students, Grovelands Primary School

The micro:bit is a pocket-sized computer that introduces you to how software and hardware work together. It has an LED light display, buttons, sensors and many input/output features that, when programmed, let it interact with you and your world. Students will be demonstrating projects and skills including, coding, designing animated LED games, and much more. Students will be showcasing some projects that can be created using micro bits and at an advanced level, they will be using extensions to bring their digital creativity into life. Visitors will also have some hands-on experiences.

Suitable for Year 4 to 7

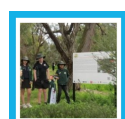


VR Site Tours

Steve Doubell, Construction Training Fund

The building and construction industry is involved in the construction, renovating, repairing and more of virtually everything you see in the built environment around you. In many ways they are at the heart of Western Australia's economic success and STEM is at the heart of the development of a skilled and sustainable workforce. In this STEM expo session attendees will use a virtual reality headset to visit a variety of construction sites and learn about the different jobs and tools involved in the construction industry.

Suitable for Year 6 to 10



Going Bush with STEM Learning

Teachers and students, Coolbinia Primary School

During the past 2 years Coolbinia PS students have been involved in creating a STEM Learning bush trail. Signage, student art and research findings were erected at specific stations along the trail with QR codes and information in Braille. Over 5,000 endemic trees, shrubs and creepers were planted to encourage species conservation. These included host plants for local native butterfly species and habitat/food sources for endangered black cockatoos.

This expo showcases this extraordinary project with ideas for how schools can implement a similar project themselves. The display will include example of signage as well as videos of the construction and progress of the trail.

Suitable for Year 4 to 10



VR Mini Theatre

Year 7 students from Halls Head College

Each year the Year 7 students from Halls Head College design and create VR experiences as part of their studies. Come along and explore experiences such as;

- The Rome Museum,
- A medieval castle walk
- Case of the headless romans
- Discovery of Narembene man
- Binar X Project – on board with the WA space program
- Halls head school Tour – our community
- Six seasons project – Munda Booja
- LOTE Language explorer - lost in the city

Visitors can use the provided tablets or use the google cardboards with their own devices to view a selection of immersive and interactive experiences.

Suitable for Year 4 to 10

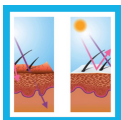


Engineers Make Things Happen

Engineers Australia WA

Engineers are scientists, inventors, designers, builders and great thinkers. They tend to be naturally curious and critical thinkers which lead them to build a myriad of skill sets throughout their study and careers. Their interests are extremely varied but typically include creativity, social, cultural and economic awareness, biology, chemistry, physics and other areas of science as well as teamwork. Join us to hear how engineers improve the state of the world, amplify human capability and make people's lives safer and easier.

Suitable for Year 4 to 10



A scientific investigation into UV light exposure on human skin

Coolbinia Primary School

Ultraviolet (UV) light makes up just a small portion of the sun's rays, but it is the primary cause of skin damage. Exposure to UV light causes damage to DNA in skin cells, increases the risk of skin cancer and accelerates signs of aging such as fine lines, deep wrinkles and dark spots. In this Expo activity attendees will be undertaking a scientific investigation into the effect of UV light on human skin. What will we find? What ways can we minimise any effects?

Suitable for Year 4 to 10

DIGIDESIGN MINI-WORKSHOPS - Students and Teachers

STEAM EXPO: hands-on activity area - Student and / or Teacher (5 to 15 min activities) cont'd...



CSI: Fingerprinting

Rhiannon Horton, North Metropolitan TAFE

Fingerprinting is one form of biometrics, a science that uses people's physical characteristics to identify them. Fingerprints are ideal for this purpose because they're inexpensive to collect and analyse, and they never change, even as people age. No two people have been found to have the same fingerprints – they are totally unique. In this STEAM expo session Rhiannon will introduce the science of ridges and how the shape of these ridges plays a part in fingerprint classification (this in turn plays into the importance of accurate and precise sampling and measurement for older attendees). Attendees will take their own fingerprints and analyse the characteristics. There will also be a "fingerprint challenge" where participants try to match partial fingerprints to the full print.

Suitable for Year 4 to 10

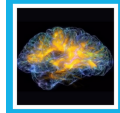


Kodeklux

Nick and Ellie Coplin, Kodeklux

KodeKLIX® is a fun, motivating and easy-to-use platform that allows children as young as eight to learn programming and electronics without traditional barriers of complex computer syntax or risk of burnt fingers from soldering wires together. Come along and check out the amazing things you can do!

Suitable for Year 4 to 8



Expand your Mind!

School of Psychological Science, UWA

When most people think about psychology, they picture a clinical psychologist talking to a patient who's lying on a couch. But psychology is so much more! This STEAM Expo session will give you a sneak peek into some of the tools we use to understand the mind. It'll also be hands on. You'll have a chance to see the electricity in your brain, experience a rubber hand becoming part of your body, listen to your heart beat in your brain, assess your hand preference, and feel what it's like to have your world turned up-side-down! So, if you're curious about how we tick, this session may just expand your mind!

Suitable for Year 4 to 10



STEM Outreach Program (AusEarthEd)

Cecily Arkell, Australian Earth Science Education

Showcasing AusEarthEd's free online earth science resources for teachers and students including hands-on activities, videos, apps and differentiated STEM projects. We will also be demonstrating the use of Ozobots in STEM problem solving through a short programming activity using coloured pens.

Suitable for Year 4 to 10



Phased Array Ultrasonic Inspection

Richard Stocker, Stork Technical Services Australia

Non-destructive testing (NDT) is used in the science and technology industry to evaluate the properties of a material, component or system without causing damage. This is critically important so that structural defects can be detected before there is a catastrophic failure. Phased array ultrasonic technology is used increasingly by Stork to inspect welds and nozzles on a variety of assets in the Oil & Gas, Mining, Power and Defence Sectors. Come along and use the ultrasonic detector probes to find defects in welds and learn how this technology is used to keep us all safe!

Suitable for Year 4 to 10



Coding drones to solve real life problems

Robopro Australia, AICODE

Drones are used increasingly in agriculture, town planning, monitoring wildlife, delivering packages and capturing live events. Industries throughout WA use drones to inspect structures that are difficult to access, monitor and map changes in the condition of structures or terrain, and provide new aerial perspectives of infrastructure. In this STEAM Expo session AICODE will demonstrate how drones can be used to unleash creativity by easily programming a swarm flight. They will also showcase how robots and drones can work together to apply student learning to real life tasks.

Suitable for Year 4 to 10



Curious about Engineering?

Clough Group

Clough is a pioneering engineering and construction company established in 1919 in Perth, Western Australia. The company manages a global workforce of over 2000 people from operating centres across Australia, Papua New Guinea, Asia, UK, and North America. Clough, who is a major sponsor for the conference, believes STEAM subjects open the door to exciting careers. Come and have a chat to the Clough team and take part in a range of fun activities including a photo booth – don't forget your camera!

Suitable for Year 4 to 10



Curved space-time

Einstein First, UWA

In the Universe, massive objects warp the fabric of space-time and colliding black holes create waves that spread out over millions of light years in space! In this Expo activity you will be introduced to the concept of space, time, light and gravity. Each concept will be introduced through various activities on the space-time simulator. Attendees will realise that gravity bends light and how 'matter tells space-time how to curve, and space-time tells matter how to move'

Suitable for Year 4 to 10

PROBLEM SOLVERS DESIGN CHALLENGE - Student and Teacher

Each session has a different real life design or STEAM challenge to solve aimed at Year 4 to 10 students. You will be posed with a real life design challenge and lead through the design process to ideate and present possible solutions.



Small Scale Renewable Energy

Engineers Without Borders

The purpose of Engineers Without Borders Australia is to harness the potential of engineering to create an equitable reality for the planet and its people. Our volunteers have worked in many developing countries to create solutions that make a difference to the lives of communities small and large. In this problem solver session attendees will explore the concepts of sustainability, renewable energy and the design process. Attendees will have the opportunity to build prototype wind turbines from classroom materials such as paper cups, paper plates, cardboard, duct tape, skewers, and pop sticks. These are tested on an electric motor to see which blade design can spin the fastest and capture the most energy. This is an example of using local materials to solve real world problems.

Suitable for Year 4 to 10 student and teacher



Around YOUR World in Eighty Minutes - A STEAMPunk Excursion

Gry Stene, STEAM Engine Global

The STEAMPunk movement provides a wonderful backdrop for inspiring youth and educators to develop research skills, learn about history, engage in collaboration, and gain numerous other essential skills for 21st century learning. This session takes the participants on a fun and engaging learning by doing a journey of discovering the world around them. Each team will find a problem in their environment or community within one of the following topics; health & wellness, environment & resource management, or social justice. The team will quickly brainstorm potential problems to solve, prioritise as a team, understand who has the problem and why it is a problem. All of this with a STEAMPunk flavour!

Suitable for Year 4 to 10 student and teacher



Batteries in Recycling Challenge

Chee Wong, E2 Young Engineers Australia

It's happened again! Another fire at a recycling facility started by batteries. Batteries entering such facilities start fires that usually result in the facility getting burnt to the ground. This happened at the Canning Vale SMRC facility in 2009. In 2019, a fire destroyed the Cleanaway recycling facility in South Guildford. Such fires are far too common (more than one every month in the USA costing millions) but you're going to change all that. In this problem solver session attendees will use their engineering and design thinking to figure out how to filter out batteries before they can do any damage.

Suitable for Year 5 to 10 student and teacher

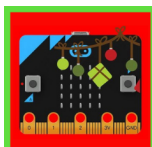


Picture Book Engineering

Kelly Ngatai, Mount Lawley Senior High School

Picture books are a great way to introduce students (and adults) to STEAM with a lens of Engineering. Using picture storybooks as a context for learning, attendees will be challenged to apply their creativity, problem-solving and communication skills to a challenge based task. Make a book come alive!

Suitable for Year 4 to 8 student and teacher



A Very STEM-y Christmas

Jessica Garara and Courtney Weaver, Carine Senior High School

Sometimes you have a great idea but you struggle to know if your idea has merit. You also may not have the ability to draw the solution. That's where rapid prototyping comes in! In this problem solver you will put your STEM skills to work as you create a custom Christmas decoration using a smart material (Polymorph), your coding skills and electronics! **Make sure you bring a laptop!**

Suitable for Year 6 to 8 student and teacher



Pipeline STEM Challenge

Cecily Arkell, Australian Earth Science Education

Your challenge is to run a subsea pipeline to connect a gas platform to an onshore processing plant taking all environmental and stakeholder aspects into consideration. What is the best route for your pipeline to take? Which STEM professionals can you consult to help you? Find out more by accepting the challenge!

Suitable for Year 7 to 10 student and teacher

PROBLEM SOLVERS DESIGN CHALLENGE - Student and Teacher

Each session has a different real life design or STEAM challenge to solve aimed at Year 4 to 10 students. You will be posed with a real life design challenge and lead through the design process to ideate and present possible solutions.



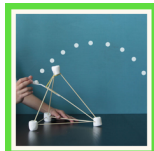
What is a Game?

Russell Scott, Vortals

This session will introduce attendees to the process of designing a game. Game design isn't about coding - it's about understanding how to manage complex user interactions using iterative design thinking processes. In this session, you will be given tasks and activities that will build your toolset for approaching complex problems and systems. Along the way you will see games in a whole new light. By the end you will have built your own game and understand how school subjects feedback positively into the world of game design.

This session challenges users of all ages and is one in which younger students are often better than adults - all will be engaged!

Suitable for Year 5 to 9 student and teacher

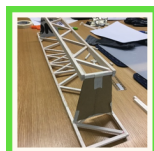


Catapult Carnage

St Hilda's Anglican School for Girls

Catapults have been used throughout the centuries as a key battle tool. A catapult works because energy can be converted from one type to another and transferred from one object to another. In this workshop groups will be researching, designing, building, modifying and testing a catapult. The final stage is to have a class competition where groups launch a foam ball. The group launching the ball furthest wins the challenge. Groups are allowed to modify their catapult during the design/build stage but only using the limited materials given to each group.

Suitable for Year 7 to 10 student and teacher

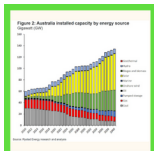


What Makes Bridges So Strong?

Clough Group

Bridges are fascinating feats of engineering. Throughout history, humans have creatively designed everything from rope and plank bridges to the Sydney Harbour Bridge. Today, primarily civil and structural engineers are responsible for the design of bridges. Since bridges must be safe under all anticipated load and weather conditions, in designing today's modern bridges, engineers take into consideration tension and compression forces. They also creatively strive to meet people's needs within budget and material constraints. In this problem solver workshop you will be challenged to build the strongest bridge using the materials you have been given. Learn what it is to be a real-world construction engineer!

Suitable for Year 6 to 10 student and teacher



The STEM Energy Game

Dr Marc Senders & Usha Patel, Woodside Energy Ltd

Climate change is one of the largest challenges countries and all of us face as we progress through this century. Different states and countries use a variety of energy sources (coal, gas, solar, wind, hydro, nuclear, tidal, etc) to make up their energy mix. As we move into the future and want to avoid irreversible climate change these energy mixes need to change to lower greenhouse gas emissions, but at the same time supply the ever increasing demand for power. In this problem solver session you will participate in a game that shows how an energy mix can vary from 2025 to 2050, based on choices your team makes, events which happen and a bit of luck. Teams will play as different states or countries and discover how the complexities of building new energy, removing others, and transitioning in-between changes over time as technology evolves and ending contracts gets cheaper.

Suitable for Year 7 to 10 student and teacher



The Energy Transition – path to sustainability

Worley

The history of civilization is linked to energy and its sources. For thousands of years, we have depended on sunlight, muscle power, and fire for the energy we need. Our society began transitioning from traditional biofuels (such as wood) to coal in the late 19th century from coal to oil and gas in the mid-20th century. We are now in the midst of a transition to renewable energy (wind, solar, hydro, tidal, etc.). Every energy transition required a change of household behaviour. If we are to successfully make this transition as a society we need to consider how we can live more sustainably.

In this problem solver session attendees will explore the factors they need to consider to reduce their reliance on resources and consumables. Attendees will also explore the difference between sustainability in urban and rural environments and brainstorm possible solutions.

Suitable for Year 4 to 10 student and teacher

Flow of the day....

*Listed program is subject to change

- 8.15am Sign-in, coffee and networking
- 8.45am Master of Ceremonies - Welcome, set up for the day and housekeeping
- 9.00am **KEYNOTE SPEAKER - DR RINA FU**
- 9.40am **ROTATION ONE - 40 min parallel sessions**
 - >> Teacher Mini-Master Classes
 - >> Student and/or Teacher DigiDesign Mini-workshops and STEAM Expo
- 10.30am **MORNING TEA**

An opportunity to network with other teachers and students, and explore trade displays
- 11.00am **PROBLEM SOLVERS DESIGN CHALLENGE**
 - >> 80 min session - parallel sessions for Year 4 to 10 students and teachers
- 12.25pm **LUNCH** - An opportunity to network with other teachers and students, and explore trade displays
- 1.00pm **KEYNOTE SPEAKER - DR SABINE BELLSTEDT**
- 1.40pm **ROTATION TWO - 40 min parallel sessions**
 - >> Teacher Mini-Master Classes
 - >> Student and/or Teacher DigiDesign Mini-workshops and STEAM Expo
- 2.30pm **WHERE TO FROM HERE? STUDENT SESSION**
 - >> Awarding of prizes to attendees, conference feedback
 - >> Opportunity for students to meet with university and industry experts and inspiring students.
- WHERE TO FROM HERE? TEACHER SESSION**
 - >> Teacher session - connect with experts, feedback forms, invitation to be on steering committee
- 3.00pm **CLOSE OF THE CONFERENCE**

Special thanks to our Sponsors

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MORE INFORMATION: <https://spark-educonferences.com.au/it-takes-a-spark-2021-perth/>

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FREQUENTLY ASKED QUESTIONS

I'm a Primary School teacher - is this suitable for me? Yes, the conference is suitable for students from Grade 4 through to Year 10 and teachers from both primary and secondary schools. We have mini-masterclasses for teachers as well as hands-on mini-workshops in which students and teachers collaborate at primary and secondary levels.

Our school has only a very small budget for STEAM - are the workshops going to help us? Yes, some of the workshops are purely paper based that develop thinking skills whilst others incorporate the use of free software available to schools. Our goal is for teachers and students to experience how simply they can begin authentic STEAM and entrepreneurial programs in their school.

We don't have a STEM/STEAM program at our school, can we still attend? We are quite advanced in the implementation of STEAM in our school, is this suitable for us? Absolutely! We have deliberately sought out activities that are applicable for the many stages that schools may be around enacting STEM/STEAM and Entrepreneurship. Whether you are just at the start or an expert we have a range of teachers and providers who will be presenting ideas and activities that will address your point of need. Our goal is have teachers connect and network with other teachers and take away lots of ideas to implement at your school.

Do we have to submit/propose a workshop to run at the conference? No. However, if you have something you think other students and teachers would like then we would love you to submit a proposal.

We are looking for new and innovative ways to develop our students, will we be able to ask questions and find out what other schools are doing? Yes – this was one of founding intentions for this conference. We want students and teachers to experience a variety of hands-on workshops so they can go back to their schools and infuse new ideas into their programs.

Why are you recommending students to attend and how many can I bring? We have found that the best exemplars of school based STEAM and Entrepreneurship programs in Australia are driven by both students and teachers. We want to spark student leadership in your schools. This is why we are suggesting to schools to bring anywhere up to 15 students to the conference. We have enough going on for over 250 people!

What does my registration include? Every student registration for the Conference includes attending keynotes and access to all activities /events / workshops and materials. Attending PD Teachers will receive a Professional Development Certificate of Professional Learning, access to all activities /events, keynotes, any master class sessions, workshops, presentation materials and notes, access to presenters and professional conversations. Price morning tea (half and full day conference) and lunch (full day conference only)

I have a question about the conference For general enquiries, please contact Rachel@spark-educonferences.com.au or call us on +61 0411270277

Is my registration transferable? Yes, your registration can be transferred to a colleague or student we ask that you provide all transfer details to us by contacting Rachel@spark-educonferences.com.au

What is the refund policy? 75% refund is available from 11 to 30 days prior to the event, after this date or for non-attendance refunds are not available and payment must be made in full. However, we will be pleased for you to transfer your registration to another attendee (see above). Sponsored and supported schools may differ. Please contact office@spark-educonferences.com.au to process this transfer.

Cancellation of an event by us In the event of insufficient applications, the programs will not proceed and registration monies will be fully refunded. In the event of the program being cancelled, registration monies only will be refunded as we will not accept liability for the payment of any other associated costs.

Payment of registration By submitting this form you are confirming that you have been given financial approval by the school/organisation to attend. All registration payments must be made prior to commencement.*Early Bird rate must be paid by the invoice due date otherwise we reserve the right to re-invoice at the standard rate. **Presenter fee (teacher/sponsor/guest) - students must still pay even if presenting.

Student attendees: You agree as your school representative teacher to take full responsibility of the students attending with you. We aim to ensure all presenters/facilitators have their WWCC and the event meets Occupational Health and Safety requirements.

Privacy Policy We promise to keep your information private at all times. We will not sell, pass on or by any other method share your information with a third party. We will store your information for the purpose of communication regarding the event and for methods required by you to use tools associated with this event. You will be added to our newsletter list for future events and correspondence, you are welcome to unsubscribe at any time.

NOTE: We will send emails prior to the workshop requiring you to take actions. This may include completing a short questionnaire to understand your current ability and needs, reading materials, accessing tools, setting up technical requirements, dietary requirements, and a reminder. Whilst we aim to keep these to a minimum your responses greatly assist in making the day more relevant to you.

Seeking Sponsors! The conference brings together students and teachers to create an inspiring future where a community happens. We want all schools to have access to events like this and your support can make that happen. Sponsors have the opportunity to deliver hands-on workshops, contribute to the conversations, help us keep our admission costs as low as possible and offer scholarships. We invite you to consider joining us as a sponsor. Please contact us at office@spark-educonferences.com.au

Accessibility We are committed to making our events as inclusive as possible. If you have additional accessibility requests, please contact us at office@spark-educonferences.com.au

Media on Premises As part of our ongoing commitment to empower students and teachers, we may photograph, video and audio record our events to share important discussions and experiences via our presentation content, so we can scale our reach to people who are unable to attend our events in person. By entering our event location during our event, you agree that Spark Education Conferences has the right to use your likeness, image, voice, etc. in photos, videos and in any educational, marketing, advertising or related endeavours relevant to the work. You will not be compensated in any way for the use of your likeness, image or voice, etc. Being on the premises during our event means that you release and hold harmless Spark Education Conferences from any claims or actions that arise as a result of this production. You may opt out at any time by letting us know.

Thank you so much for your support and cooperation. We look forward to partnering you to create an inspiring conference.