VICTORIA

It Takes a Spark!
STEM Conference

Thursday, 24 October 2024

STEAM – Inspiring collaborative and innovative teams, change-makers and problem solvers

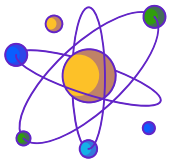
The theme of the conference is to highlight how STEAM skills and mindsets can foster curiosity, innovation, entrepreneurship and social impact. The conference will explore how education and teachers can achieve this, and how to foster interdisciplinary and cross-cultural partnerships with industry, universities and STEAM organisations.

The It Takes a Spark! STEM Conference inspires and engages forward thinking Year 4 to 10 students, teachers and leaders in STEAM.

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

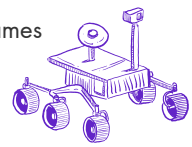
>> Cyber Team Red
>> Reimagining STEM: Definitions and Disruptions
>> Implementing a school(s) wide approach to design thinking using a Community of Practice
>> Writemark: Marking writing in the blink of an AI
>> Storming the Classroom: A student-led journey in creating a real-world solution
>> Immersion in Education
>> First Steps to designing a well-planned STEM Program

Hands-on sessions for students and teachers, examples...



>> Engineering design and drawing using Splat 3D
>> Designing For Community Connectedness
>> Railway Signalling with Puffing Billy
>> Exploring the World of AI
>> Detecting the Unseen: Dark Matter
>> CyberHero: Keep the cyber space safe
>> Coding with Dash Robots
>> AI-based 3D Printing of Static and Functional Shapes
>> aMAZEing LEGO!
>> Making Micobit Companions
>> LiveBinders
>> Pixel Power-Up: Arcade Game Design!
>> STEAM EXPO activities
> Inspired by Nature: Discovering design secrets from the natural world
> Indigenous Creativity
> Unleash Your Sustainability Superpower
> The Martian Garden
> Engineering in Action!

Problem Solver sessions: design challenges taking students and teachers through the design process including...



>> Game on! Using table top games to plan and design video games
>> STEM for Wildlife Conservation
>> Lift off! Design your own satellite
>> Indigenous Inventors
>> Designed by Nature: Innovating with Biomimicry
>> What's the Solution to Plastic Pollution?
>> Moonbase - Designing to Survive and Thrive
>> Mental Health and Wellbeing Youth Design Challenge

VIC Outstanding Keynote Speakers

DR SARA WEBB

Astrophysicist & Superstar of STEM Centre for Astrophysics & Supercomputing Swinburne University of Technology

The last 100 years of astronomy has seen our knowledge of our own home galaxy, universe and even the things that make-up us change in almost immeasurable ways. We simultaneously know more and less about the Universe we live in, and with new and exciting telescopes, we'll soon have too much data to work with manually.
To prepare for the future of Astronomy, Dr. Sara Webb works with optical telescope data and machine learning to explore explosions in the universe and how astronomers find them. Sara focused on studying small, yet mighty, red dwarf stars and their flares. When a star flares, energy and matter are spewed out into the surrounding solar system, and Sara has worked to build up a large and unique population of these stars that flare in very short periods of time. In her broader research into investigating the use of AI in team situations, Sara is currently working on studying how astronomers work in their various cognitive states. Aside from her academic research, Sara also coordinates and co-leads Swinburne's unique student space challenge programs, sending student led experiments to the International Space Station. This Australian wide program gives students insight into a space science career.

DR PRUE FRANCIS

Marine Scientist & Superstar of STEM, School of Life & Environmental Sciences, Deakin University

A former high school teacher and now marine scientist and educator at Deakin University, Prue is exploring the extent to which ocean literacy is being taught in schools across Australia and evaluating innovative methods to enhance ocean literacy. Notably, Prue and her Deakin SEA.Ed team have been exploring ocean-themed picture books as a useful tool to educate school children about marine science. Subsequently, Prue has co-authored a children's book, The Great Southern Reef (by Paul Venzo, Prue Francis; illustrated by Cate James) to promote ocean education in schools and raise awareness of Australia's Great Southern Reef.
Prue regularly engages with community groups and is passionate about inspiring younger generations to be curious about life underwater. Prue visits schools to present her fun and engaging (not slimy!) Seaweed Matters incursions and champions ocean literacy on Melbourne's independent radio station, Triple R.

Contact

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Host School

The Knox School
CO-EDUCATIONAL | ELC TO VCE

Conference Coordinator

Intuyu Consulting | Empowering 21st Century Learning

Spark STEM Conferences

Register: spark-educonferences.com.au/victoria-2024/

First Steps to designing a well-planned STEM program

Dr Adrian Bertolini, Intuyu Consulting
Schools often begin enacting STEM by introducing STEM clubs or activities at lunchtime or after school, having STEM specialist subjects and maker spaces, or even participating in STEM competitions. These approaches are all great ways to begin laying the groundwork for a sustainable STEM program. The challenge for many schools will be moving STEM from these groundwork laying activities to an authentic STEM program that delivers the desired outcomes.
In this session Adrian will outline the thinking and planning that primary schools will need to do if they are going to design a whole school STEM program that delivers. This includes discussing creating a design brief for a STEM program, mindset and capabilities planning, learning ladders, and curriculum mapping approaches. Templates for planning will be provided.
Suitable for Primary Teachers

Reimagining STEM: Definitions and Disruptions

Roxanne Summer, Siena College
The first challenge for teachers to develop an authentic STEM program is breaking down the existing perceptions about what STEM / STEAM is – including that it only involves Science, Technology, Engineering, Arts, and Maths.
This session looks at how to unlock student creativity and imagination by redefining STEM and STEAM to go beyond the normal silos and widen students' perceptions. It will also explore the 'disruptive thinking' model which empowers students to become better risk-takers. The myth of teacher as expert will also be debunked, which inspires students to see themselves in fields previously dismissed as unattainable. Teachers will leave with an entirely new view of how they can begin to enact STEM / STEAM in their school and how they can partner with local organisations to create a sustainable low-cost model.
Suitable for Primary & Lower Secondary Teachers (80 min session)

Implementing a school(s) wide approach to design thinking using a Community of Practice

Oakleigh Education Plan
The Oakleigh Education plan was created to rejuvenate education across three schools in Oakleigh – getting students more engaged with their education, encouraging them to aim higher, while raising community pride in local schools. An early challenge was "How could they upskill the teachers in all the school in design thinking?"
In this teacher workshop the OEP team will share their experience implementing design thinking across three schools using a Community of Practice approach. We will talk about the strategies we used, what worked and what didn't and demonstrate some of the tools and activities we used with teachers. This is a fabulous workshop for school leaders and cluster teams to attend to learn what they can do.
Suitable for Primary & Secondary Teachers

Cyber Team Red

Questacon
The Australian government has identified cyber security as one of the six industry sectors considered vital for the long-term prospects of the Australian economy. But how can we support young people to learn about cyber security and the multitude of careers in the cyber industry?
In this teacher session you will have the opportunity to discover this through playing the tabletop role-playing game - Cyber Team Red. Cyber Team Red is designed for 2 to 4 players aged 12 and up and explores cyber security concepts using teamwork, problem solving and communication. Players take on the roles of elite cyber professionals who live within the game world, making decisions and dealing with the consequences as the mission is completed. No experience in tabletop role-playing games or cyber security needed. This is a fun, engaging and gamified way to learn (and teach) about the cyber industry!
Suitable for Upper Primary and Secondary Teachers

Writemark: Marking writing in the blink of an AI

Elastik
Writemark offers real-time AI assessment of student writing against the NAPLAN rubric and the Victorian curriculum, supporting Australian teachers by significantly reducing marking workload. It is informed by thousands of student essays and texts and provides tailored, contextual, feedback for each student, accurate results and differentiated target areas to support teachers to design more effective instruction.
In this teacher session you will experience a demonstration of Writemark and have the opportunity to get all your questions answered. If you are interested in testing the software with your own student work contact Jarrod via jarrod.main@elastik.com 3-5 days in advance of the conference so that we can have the correct format.
Suitable for Primary and Secondary Teachers

Storming the Classroom: A student-led journey in creating a real-world solution

The Knox School
With no coding, electronics or design experience, teachers at The Knox School will show you how to deliver an interdisciplinary and collaborative unit of learning. Through an immersive experience, Knox students will take you through how to ideate, design and prototype their weather station powered by a Raspberry Pi.
Suitable for Primary and Secondary Teachers

Immersion in Education

Mindflight7
Virtual reality allows users to interact with computer-simulated environments and can enable virtual field trips, immerse students in historically significant events, simulate laboratory environments and much more.
In this teacher session you will be guided in creating lesson plans that integrate VR for immersive, interactive learning. You will learn to enhance subject-specific lessons with VR, fostering engagement and deeper understanding through hands-on, virtual experiences.
Suitable for Primary and Secondary Teachers

CyberHero: Keep the cyber space safe

La Trobe University – School of Computing, Engineering and Mathematical Sciences
Technology Advances Rapidly. So Do Cybercriminals. Cybersecurity is important because it protects all categories of data from theft and damage. This includes sensitive data, personally identifiable information, protected health information, personal information, intellectual property, data, and governmental and industry information systems.
In this workshop, you will be introduced to the word of cybersecurity. Starting with a fun cyber quiz you will then gain hands-on experience on different cybersecurity concepts such as cryptography, password cracking, cyber safety and risk assessment.
Suitable for Year 7 to 10 students and/or teacher

aMAZEing LEGO!

Malvern Valley Primary School
A maze is a puzzle with twists and turns, where you try to find a path from the entrance to the exit without hitting dead ends. The goal of a maze is to get through it, which means going the wrong way, retracing your steps, and choosing different paths.
In this hands-on session, you will design and create a LEGO maze marble run. You, in your role as a budding engineer, will need to apply your mathematical knowledge of angles and parallel lines in order to meet the design brief. Teachers come along and learn how the Design Thinking process can be used to tackle any problem and how you can run such activities in your class!
Suitable for Year 4 to 8 students and/or teacher

LiveBinders

McKinnon Primary School
Have you ever struggled to research and organise everything you are learning in a STEM topic? Making a portfolio to capture everything is so important in STEM – especially as you get more experienced at STEM – because it helps you think your way through the engineering process. LiveBinder is a digital tool designed to create virtual binders. You can use it to create electronic portfolios to showcase your learning or talents. It allows you to evaluate, assess, filter, and organise information. You can upload your documents, photos and create tabs to store resources and favourite sites. It even can be used as a presentation tool – a personal website! In this workshop the McKinnon Primary students will show how cool LiveBinders is and will present their individual LiveBinders. They will guide you to create your own binder, tabs, subtabs then uploading videos, websites, text, photos etc.
Suitable for Year 4 to 6 students and/or teacher

Detecting the Unseen: Dark Matter

ARC Centre of Excellence for Dark Matter Particle Physics
Dark Matter is the mysterious material that scientists think makes up over 80% of our Universe but has not yet been directly detected. Australia is at the forefront of Dark Matter research. The Southern Hemisphere's first Dark Matter direct detection lab was built in regional Victoria and began operating in 2021! The science of dark matter involves everything from the largest structures in the Universe to the smallest known particles that make up the atom. In this session, students and teachers will be guided through activities to understand how scientists learn about the 'invisible' with clues from the cosmos and to understand how scientific discoveries are building our understanding of matter in the universe. Teachers will receive lesson plans to bring these activities back to their classrooms.
Suitable for Year 7 to 10 students and/or teacher

An Introduction to the Arduino Magic

The University of Melbourne
An Arduino is an open hardware development board that can be used by engineers, hobbyists, and makers to design and build devices that interact with the real world. They can be used for a wide range of applications such as automating your home, creating smart gardening systems, building robots, designing IoT devices, and even making wearable technology.
In this workshop you will get an introduction to Arduino based implementation of electronic projects and build and test simple automation/sensor projects using an Arduino and a range of electronic components.
Suitable for Year 7 to 10 students and/or teacher

NASA spaghetti/marshmallow tower challenge

Deakin University
In Engineering it is highly important to test your theories and designs through prototyping. Prototyping and the iterative design process make for constant improvement and eventual success.
In this session you will have the opportunity to build the tallest freestanding structure using spaghetti and tape to support a marshmallow for 15 seconds. This challenge introduces engineering concepts like compression and tension but also more transferable skills like teamwork and strategic thinking and planning. During the challenge you will brainstorm, design, build, test, and redesign, applying real-world forces. Are you ready to be an Engineer?
Suitable for Year 7 to 10 students and/or teacher

Exploring the World of AI

STEM Incubators
Artificial Intelligence is already playing a significant role in a range of industries including healthcare, transportation, finance and agriculture. It is essential that you understand what AI is, how it works, how it is different from machine learning, and how you can make the most of both in safe and ethical ways.
In this workshop you will be introduced to the concepts of AI and machine learning and have the opportunity to train and test models on a machine learning platform. Run by students who volunteer at STEM Incubators this is a great session for students and teachers!
Suitable for Year 4 to 6 students and/or teacher

Railway Signalling with Puffing Billy

Puffing Billy Railway
One of the most important things at Puffing Billy is safety and one of the most important pieces of equipment to keep our passengers safe is our signalling system that allows the train to move along different parts of the line and stop people and trains moving along the track when it isn't safe.
In this workshop you will be faced with a real-world STEAM challenge at Puffing Billy Railway. As designers you are going to use design thinking to come up with innovative ideas and create a prototype to help solve this problem. You will need to rely on teamwork and communication to complete this task and create a design as a team.
Suitable for Year 5 to 6 students and/or teacher

AI-based 3D Printing of Static and Functional Shapes

La Trobe University – School of Computing, Engineering and Mathematical Sciences
Artificial intelligence (AI) has emerged as a transformative force, influencing and often dominating various technological domains. Its impact extends across diverse fields, including healthcare, finance, manufacturing, and communication.
In this workshop, Dr Bruce Lu will share how AI will help 3D printing in manufacturing. Discover how advanced AI algorithms can be used to handle digital 3D data to produce various static and functional shapes. You will even get the chance to use a hand-held 3D scanner!
Suitable for Year 7 to 10 students and/or teacher

Engineering design and drawing using Splat 3D

Tony Doyle
Engineers must communicate their design thoughts, ideas, and technical requirements to a variety of stakeholders, such as other engineers, manufacturers, and clients. Drawings offer a universal visual language that enables everyone to fully understand the design idea. In this workshop you will use the Splat 3D drawing tool to begin to learn how to draw isometric diagrams. The skills and spatial awareness you gain here will make a big difference when you progress to using Computer Aided Drawing (CAD) tools and 3D printing projects. Have fun while you learn to draw like an engineer!
Suitable for Year 4 to 6 students and/or teacher

Pixel Power-Up: Arcade Game Design!

Boneo Primary School
Have you ever wanted to create your own arcade game? Maybe a retro game like Super Mario, Galaga or even Space Invaders?
In this arcade game design activity, using Microsoft MakeCode Arcade, you will have the opportunity to unleash creativity and program your own games. You will learn logical reasoning as you design gameplay mechanics and solve coding challenges. Take it to the next level by learning how we built an arcade machine at Boneo Primary, combining digital creativity with hands-on construction skills.
Suitable for Year 4 to 7 students and/or teacher

Gears in motion!

STEMed Kits
One of the ways we first learn how to problem solve and critically think is by building stuff. Whether it is wooden blocks, Lego, Meccano or our STEM education kits, we all go through some design thinking process in order to build the desired product.
In this workshop you will learn about forces, motion and gears from first principles as you build a Trike. Teachers will discover how simple kits such as these can support the delivery of STEM and the Australian curriculum in classes.
Suitable for Year 5 to 8 students and/or teacher

Making Micobit Companions

Kilvington Grammar School
While owning a pet can be joyous – bringing you cuddles, companionship and exercise, it is getting more and more expensive to look after one.
In this hands-on workshop you will pair up to design a plushie or 3D printed Microbit Pet. In your pairs you will use felt, paper and cardboard to prototype your dream companion and then code Microbits to animate! This is a great digital technologies activity that showcases how you can prototype a design from start to finish.
Suitable for Year 7 to 9 students and/or teacher

Coding with Dash Robots

Flinders Christian Community College
Obstacle avoidance, in robotics, is a critical aspect of autonomous navigation and control systems. It is the capability of a robot or an autonomous system/machine to detect and circumvent obstacles in its path to reach a predefined destination.
In this hands-on workshop you will bring Dash Robots to life using block coding to navigate obstacle courses and perform fun tasks. This interactive session combines critical thinking, problem-solving, and creativity, allowing you to explore the fascinating world of robotics and how they can be programmed to avoid obstacles!
Suitable for Year 4 to 7 students and/or teacher

STEAM Power!

Mindflight7
VR is a fully immersive technology where users wear a head-mounted display or headset and experience a computer-generated world of imagery and sounds.
In this session you will have the opportunity to immerse yourself in VR educational experiences where STEAM subjects come alive. Engage in open-heart surgery, explore unique ecosystems, undertake space missions, and perform animal dissections. This is a great way to bridge theory and practice, and develop problem solving and critical thinkers for real-world challenges!
Suitable for Year 4 to 10 students and/or teacher

Designing For Community Connectedness

Akorn Education
Social isolation and loneliness affect approximately 5 million Australians. It can lead to poor mental and physical health. Loneliness is estimated to cost the economy $2.7 billion per year.
You are invited to team up, reflect on your experiences and collaborate a solution using your STEM skills.
Suitable for Year 5 to 10 students and/or teacher

STEAM Expo: hands-on activity area - Student and/or Teacher

(selected as one workshop, activities may not run in both rotations)

Making with Makey Makey

Siena College
In this expo activity you will discover how the students of Siena College use the Makey Makey board in a variety of projects. With no to low-cost additional materials these projects encompass coding, making, design thinking skills, and are also excellent for collaboration. Step-by-step project guides will be shared, along with other resources.
Suitable for Year 4 to 8 students and teachers

Australian STEM Video Game Challenge!

Australian Council for Educational Research
The Australian STEM Video Game Challenge (STEM VGC) is a free national video game development competition for students in Years 3 to 12. It is a fun challenge that aims to engage more students in STEM and enable them to develop real world skills required to succeed in work and life.
This workshop will showcase the 2023 winning entries and demonstrate how schools can enter and what it takes to make a winning entry!
Suitable for Year 4 to 10 students and teachers

STEAM Expo: hands-on activity area - Student and/or Teacher

(selected as one workshop, activities may not run in both rotations)

The STEAM Journey at Puffing Billy

Puffing Billy Railway

The early railway systems are clear demonstrations of how the things you learn in school are used in real world applications. Come and learn about how concepts such as energy, force and motion, past and present, design and technology and biodiversity are part of the Puffing Billy Railway multiverse and even have a go to build a signal tower using Lego and Meccano! Teachers can find out about the range of curriculum-aligned education programs at Puffing Billy Railway.

Suitable for Year 4 to 6 students and teachers

Get STEMed – Start with first principles thinking

STEMed Kits

What happens when Engineers, Designers and Teachers come together? You get a family who has collaborated, rethought, planned and delivered STEM products that better prepare our 21st century problem-solvers and entrepreneurs from a young age! Come along and find out about how our curriculum aligned kits and lesson plans can support young people to move fluidly between the disciplines of Science, Technology, Engineering, Art and Mathematics while maintaining their natural inquisitiveness!

Suitable for Year 4 to 9 students and teachers

Drone Experience

Pakronics

Drones are used for a wide range of activities including search and rescue, surveillance, traffic monitoring, firefighting, photography and videography as well being used increasingly by organisations such as energy companies, agriculture and mines to inspect their assets. Drones are also great in STEAM education in learning about programming, design, robotics, and more.

In this STEAM Expo activity, you will have an opportunity to learn how to fly safely and show your drone maneuver to your class!

Suitable for Year 4 to 10 students and teachers

STEMPower – from concept to reality

Orchard Grove Primary School

Electricity and circuits are just about everywhere and a part of most of our daily lives. From the electrical wiring in your home that powers the lights and TV, to the ignition system that starts your car, there are circuits everywhere that allow electricity to safely flow all around us.

In this Expo the students from Orchard Grove Primary will showcase some of their amazing electrical creations including working vacuum cleaners and Ferris wheels! They will have the working tools that they created from scratch (including 3D designing and printing parts), as well as posters/presentations with the prototypes and their design process. The students will discuss what they did, how they researched and created their tool, also how it works. They will also talk about troubleshooting and how they got to the end product. Come along and be amazed!

Suitable for Year 4 to 6 students and teachers

Data Analysis & AI Technology

Elastik

Elastik is a revolutionary new platform that empowers teachers to pinpoint and address unidentified gaps in their students' learning in Maths, English and Science. It saves time by reducing the administrative burden, freeing teachers to do what they do best: stretch children to help them thrive.

In this Expo activity we will demonstrate Elastik's ability to analyse multiple curriculum linked data sets to instantly pinpoint gaps in learning to inform planning & teaching. We will also demonstrate how Elastik is leading the way in AI technology through its writing assessment tool, Writemark.

Suitable for Year 4 to 10 students and teachers

An Electrifying Experience!

Cranbourne West Primary School

Real world STEM is not just about the individual disciplines of science or technology or engineering or even mathematics. It involves multiple disciplines at the same time. In this expo, the students from Cranbourne West Primary will challenge you to participate in two learning challenges that, when combined, produce a fantastic STEM collaboration between science and digital technology.

- Science – create a fun and challenging game whilst learning about series and parallel circuits.
- Digitech – learn how to program a microbit to slot in with the game and make it even more exciting!

Are you ready to be electrified?

Suitable for Year 5 to 10 students and teachers

STEMpal: You can't be who you can't see!

Curiosity Factory

Have you ever wondered what people who work in STEM fields actually do? How can you ever find out about all the amazing things you can do and be with STEM? Especially when the current high school curriculum only includes 1 woman in the 145 STEM professionals mentioned.

In this expo activity you will not only meet some real live STEM professionals but also learn how you can connect and become pen pals with some amazing STEM professionals. Discover real world STEM people -so you can be who you can see!

Suitable for Year 5 to 8 students and teachers

Indigenous Creativity

Dr Tim Patston, Creative Actions

A key challenge for teachers is integrating General Capabilities such as Critical and Creative Thinking and Cross Curriculum Priorities such as Aboriginal and Torres Strait Islander Histories & Cultures into their subjects. For at least 60,000 years our First Nations People have been using social, medical, ecological and STEM creativity to solve problems.

In this Expo you will explore 5 open-ended Indigenous STEM examples which will spark you to consider how and why Indigenous Australians solved STEM problems in a certain way.

Suitable for Year 5 to 10 students and teachers

Augmented Reality Live

Worley

Augmented Reality (AR) software allows 3D visualization, collaboration, and field to office communication across all stages of construction, such as design review, facility management, and more. Utilizing augmented live technology, engineers are now able to visit the site and experience their design in the field virtually. Communication and collaboration in virtual environments have the power to significantly reduce emissions within all facets of business operation. Now, more than ever, it is vital that businesses choose to actively work towards improving their environmental footprint and for Worley specifically to strive to deliver a more sustainable world.

Suitable for Year 7 to 10 students and teachers

Play and Learn with Questacon

Questacon

Questacon is focused on supporting young people to develop the attributes, skills, knowledge, and agency to thrive in tomorrow's world. We do this through creating and delivering interactive, relevant, and fun experiences!

In this Expo come and participate in activities such as:

- The Leaning Tower of Lire exploring engineering principles
- Hand-cuff challenge and one hand knot tying challenge.
- Coding friendship bracelets
- No-Code coding

Teachers - come and find out about all the great learning experiences and resources we provide! **Suitable for Year 4 to 10 students and teachers**

Inspired by Nature: Discovering design secrets from the natural world

Royal Botanic Gardens Victoria

Biomimicry is the practise of observing what works in nature and copying it to solve problems, create and innovate. To do this we must identify the function in nature that we want to emulate and use in design.

This expo activity will challenge you to deconstruct a Biomimicry invention, observe and explore natural materials using scientific tools (like microscopes and magnifying glasses) and identify and discover functions in nature, linking them with functions in design. While you are there, find out about the Royal Botanic Gardens and its programs!

Suitable for Year 4 to 10 students and teachers

Blast Off to the Virtual Universe!

OzGrav (ARC Centre of Excellence for Gravitational Wave Discovery)

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 session, students will explore the planets of our solar system, the varieties of stars in our universe, and beyond to exotic objects such as black holes! Using virtual reality exploration, students will observe and learn about: differences and similarities among planets, why stars have different sizes and colours, how stars change over time, how stars affect the motion of objects in space, and how scientists observe dark objects like black holes.

Suitable for Year 4 to 10 students and teachers

Immersive Virtual Reality Experience in Construction Training

La Trobe University – School of Computing, Engineering and Mathematical Sciences

Dislike the dirty environment of a construction site? Don't feel like physically sweating from the training? What's a better and safer way to train our future construction practitioners than VR training? Let's dive into our carefully curated VR construction training game, making the learning process easier than ever! This VR game aims to enhance building inspection and project management skills amongst future construction practitioners through a fun yet effective method.

Suitable for Year 7 to 10 students and teachers

STEAM: From an acronym to real world thinking

MakerDojo

STEAM is much more than the disciplines captured in the acronym. It is about developing depth of thinking and applying understanding to real world challenges so that learners become flexible and agile problem solvers.

Discover how to engage learners with hands-on STEAM activities ranging from cardboard arcade games and floor pianos to 3D holographs and fidget toys as well as using micro:bits, Makey Makeys and Arduinos. These activities will demonstrate and explore how to excite, engage, and extend the creativity and knowledge of all learners whilst developing transferable skills.

Suitable for Year 4 to 10 students and teachers

The Martian Garden

ARC Centre of Excellence for Plants for Space

On entering the Mars habitat, you will become the scientists needed to sustain life off-earth, plant biologists, engineers, psychologists and food chemists. You will program vertical farms and harvesting robots, measure plant growth conditions, use DNA and imaging technologies, process plants and 3D print them into new Space-food products.

Suitable for Year 4 to 10 students and teachers

Class VR and Promethean Interactive Panels

EduNet

Edunet is a leading provider of ICT consultancy within public, catholic and private schools to enhance classroom outcomes through the right technology solutions. Visit our interactive stand to discover how Promethean interactive boards and displays can be used in the classroom, find out the options we can provide around Chromebooks and other BYOD devices, and educators and students will have a hands on opportunity to play and interact with the Virtual Reality tools!

Suitable for Year 4 to 10 students and teachers

Engineering in Action!

The University of Melbourne

Engineers apply scientific principles to analyze, design, invent, code, build, and create to solve all sorts of problems and make the world a better place. One of their most important tools is their own creativity.

In this Expo you will have the opportunity to meet current electrical, mechanical and infrastructure engineering students at the University of Melbourne. They will showcase their current extracurricular projects. Activities will include a wide range of projects showcased by groups such as Engineers Without Borders, Melbourne Space Program, Robotics clubs and more!

Suitable for Year 4 to 10 students and teachers

Unleash Your Sustainability Superpowers!

Academy for Enterprising Girls

The Academy for Enterprising Girls is a fun and exciting entrepreneurship program, available FREE to all young women in Australia aged 10 – 18, funded under the Australian Government's Women's Leadership and Development Program. The Academy is designed to cultivate young women's skills in design thinking, entrepreneurial and business skills.

In this Expo you will explore and discover the 17 United Nations Sustainable Development Goals. You will have an opportunity to create a list of things you care about under the umbrella of your chosen SDG goal and then using rapid ideation, list 5 innovative/enterprising solutions to help reach the goal.

Suitable for Year 4 to 10 students and teachers

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 and teachers. You will be posed with a real life design challenge and lead through the design process to ideate and present possible solutions.

STEM for Wildlife Conservation

Zoos Victoria

In the realm of wildlife conservation, technological advancements are crucial for safeguarding threatened species. Examples of current technologies used in wildlife conservation include automatic feeders, thermal and camera traps, geolocators, multi-sensor loggers, drones and radio trackers. In this problem solver session, you will use design thinking to develop and design a prototype technology that can be used to help scientists locate, track and/or monitor some of our elusive endangered species; the Plains Wanderer, Lead beater's possum, Orange Bellied Parrot and Spotted Tree Frog. Come and discover how conservation scientists address complex technological challenges to look after Australia's wildlife.

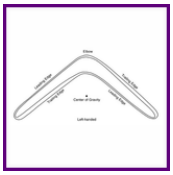
Suitable for Year 5 to 10 students and teachers

Lift off! Design your own satellite

Swinburne Youth Space Innovation Challenge

Satellites play an essential role in our everyday lives. In fact, they help us to talk to each other and stay connected; they provide important information about our planet by monitoring weather and climate change; and they help us travel safely in our cars, ships, and planes.
In this problem solver session you will be given materials explaining the different types of satellites, based on function and type of orbit, and have the opportunity to design a satellite to solve a real world problem.

Suitable for Year 4 to 10 students and teachers



Indigenous Inventors

The Maker Difference

One of Australia's finest 20th century thinkers and inventors was a Ngarrindjeri man. He was curious about the world in all its physical and spiritual wonders. In one of his inventions, he drew on the way that boomerangs move to develop plans for a flying machine that used spinning blades allowing it to rise straight up; much like the modern-day helicopter. In this problem solver session, you will use your skills in critical thinking and creative problem solving through the maker cycle (design process) to create a helicopter. Learn about one of Australia's remarkable First Nations inventors while applying what you have been learning at school in an authentic way. Teachers will learn ways to incorporate and acknowledge First Nations voices and designs in STEM lessons and receive a handout detailing how they can tailor this lesson to meet the needs of students of different ages and learning abilities.

Suitable for Year 4 to 6 students and teachers

Designed by Nature: Innovating with Biomimicry

Royal Botanic Gardens Victoria

What if there was a design guide with real-life examples that were sustainable, good for the planet and accessible to everyone? There is! It's called Nature! Biomimicry is the practise of observing what works in nature and copying it to solve problems, create and innovate. This workshop will introduce you to, and learn the skills needed for this modern design practise. You will also be inspired by some of the most weirdly wonderful plants to bring nature's ideas to an innovative and sustainable biomimetic design concept.

Suitable for Year 4 to 10 students and teachers

Become a disease detective- solve an outbreak!

Rladies-Melbourne

A mysterious disease is causing people to fall ill at your school. What are the common characteristics of the people that are ill (e.g. did they all eat the same thing)? What are the common symptoms of infected people? How can we stop the epidemic before it spreads throughout the whole school and beyond?
In this session you will learn about epidemiology and how medical teams use data to pinpoint the causes of a disease and come up with solutions to stop outbreaks. You will cover key concepts such as 'what is an outbreak' and 'what do epidemiologists do', as well as exploring concepts such as data visualisation and the importance of clear science communication

Suitable for Year 7 to 10 students and teachers

What's the Solution to Plastic Pollution?

Cetacean Science Connections

Plastics are now found in every marine ecosystem across the globe. Larger pieces can be ingested by marine life, while smaller plastic molecules can impact the health of individuals. Microplastics were also found in humans for the first time in 2022.
This problem solver session poses a real-life question often asked by wildlife managers, marine scientists and environmentalists – how can we remove the plastic in our oceans?
How would you solve the problem?

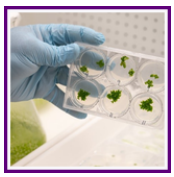
Suitable for Year 4 to 10 students and teachers

Space Design: Humans on the Moon

Scienceworks/Museums Victoria

Space travel is difficult. There are many challenges to overcome as humans venture further in space. Humanity has recently turned its attention towards creating a Moon Base. This will be a place of research and a launching point for venturing even further from Earth.
In this Design Sprint you will consider the physical environment of the moonscape, the resource limitations, and the physical and psychological difficulties humans will face. You will be challenged to draw on space knowledge to overcome the challenges of human habitation on the moon.

Suitable for Year 4 to 8 students and teachers



Moonbase – Designing to Survive and Thrive

ARC Centre of Excellence for Plants for Space

The ARC Centre of Excellence for Plants for Space aims to create on-demand, zero-waste, high-efficiency plants and plant products to address grand challenges in sustainability for Space and on Earth. If humanity is going to be exploring the universe, then we will need to reimagine plants, food, and farming.
In this design sprint session, you will explore the challenges of growing plants in space and come up with possible ways to grow plants to supply the foods, materials and medicines humans need to survive. Not just for survival but in ways that support happiness and mental health, and sustainable farming on Earth.

Suitable for Year 4 to 10 students and teachers

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 and teachers. You will be posed with a real life design challenge and lead through the design process to ideate and present possible solutions.

Game on! Using tabletop games to plan and design video games

Australian Council for Educational Research

Game developers turn game concepts into a playable reality. This is done by programming features, coding visual components, and testing models until the game is market ready.

In this problem solver session you will learn about gameplay concepts and how card games can be used to plan and design video games from these concepts. You will then have the opportunity to develop your very own card game related to the 2024 STEM VGC theme that you can take home and play with family and friends. You can even use this as a resource to develop a video game to enter the STEM VGC!

Suitable for Year 4 to 10 students and teachers

Creativity in Indigenous STEM

Dr Tim Patston, Creative Actions

It can be challenging for teachers to integrate General Capabilities such as Critical and Creative Thinking and Cross curriculum Priorities such as Aboriginal and Torres Strait Islander Histories and Cultures into STEM subjects. For at least 65,000 years First Nations peoples have been creative problem solvers, particularly in STEM. From Indigenous astronomy to chemistry, maths, medicine and physics, First Nations peoples were the world's first scientists.

This workshop offers teachers and students the opportunity to explore Indigenous creativity in STEM through a range of practical activities. You will be given background information regarding an element of Indigenous STEM and have the opportunity to

- develop your own lesson plan if you are a teacher
- create an Indigenous product if you are a student

Come and learn about the amazing world of Indigenous science and creativity

Suitable for Year 5 to 10 students and teachers

Design for reuse – egg drop challenge

The University of Melbourne

Engineering design is about solving problems with technology, not just warnings, training or policy. In this task, the egg represents something fragile we want to protect with a technical solution – a human, an organ, or maybe eggs in a manufacturing plant. Past engineering practice has used a significant amount of energy and resources and almost nothing, whether wind turbines, medical devices, or hair dryers can be reused or even recycled at the end of its useful life. Current engineering is changing this.

In this problem solver session, you will tackle an updated version of the classic egg drop. You will be coached through an engineering design process, but the process is updated to match the needs for engineering to solve global challenges with less resources and create sustainable solutions that can be reused.

Suitable for Year 4 to 8 students and teachers

Mental Health and Wellbeing Youth Design Challenge

Young Change Agents

The mental health and well-being of young people can affect one's ability to attend school and strive for a bright future. Recent research shows that 39% of young people aged 16-24 have experienced a mental disorder in the past year and 75% of mental health problems emerge before the age of 25, meaning school years are critical for prevention and early intervention.

In this important workshop Young Change Agents will support you to explore questions around connection, stress, happiness, healthy relationships, and habits. Using the design process you will brainstorm possible solutions, and plan and deliver a 2-minute pitch at the end of the workshop.

Suitable for Year 7 to 10 students and teachers

Sustainable engineering in action

Worley

Worley engineers work with a wide range of industries to support them to transition to more sustainable energy sources, while helping them provide the energy, chemicals and resources that society needs now.

In this problem solver workshop, you will experience two hands-on activities that highlight the underlying STEM involved in creating a more sustainable society. In one activity you will create a water pump. In the other you will build a wind turbine/solar panel and demonstrate how solar power can make turbines spin.

Suitable for Year 7 to 10 students and teachers

Artificial intelligence; Real Emotions: Chatbots Changing Mental Health

John Monash Science School

The increasing presence of AI in our society presents a remarkable opportunity for humans and AI to collaborate fruitfully in the workplace, forming genuine connections and unleashing the full potential of AI in professional settings.

This workshop will showcase the transformative application of AI chatbots in mental health therapy, and give you an opportunity to engage in hands-on coding activities to create a chatbot to support mental health for young people.

Suitable for Year 4 to 10 students and teachers

Who the conference is for...

- **Year 4 to 10 students** - those who are already (or aspire to be) STEM Leaders in your school OR students' schools wish to spark an interest in, and engagement in STEM
- **Teachers** - those who have little experience and those who have a lot, looking to be inspired, participate in hands-on professional learning and network with peers
- **Heads of Learning Areas / Curriculum** - who wish to connect and elevate their STEM discipline
- **Principals and Deputy Principals** - to witness what is possible by embedding STEM authentically in your school
- ...and the event is a 6 hour Professional Learning day for teachers - **certificate provided**

Further information

- In 2024 the It Takes a Spark STEM Conferences are being held in Melbourne, Perth, Tasmania and Queensland.
- Registration and FAQ's can be found on the website, along with Media and News appearances for reference.

Registration

- Begins at 8.45am / completes at 2.45pm
- Early bird registration is recommended **closing** 11/09/2024
- Book Now or Hold places: you can hold places whilst you gain approval. Register and select 'hold place'.
- **Teachers** can attend without students.
- **Students** must attend with their teachers.
- Excursion pack available
- Morning tea and Lunch included.

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 SARAH WEBB** **ASTROPHYSICIST AND SUPERSTAR OF STEM, CENTRE FOR ASTROPHYSICS AND SUPERCOMPUTING, SWINBURNE UNIVERSITY OF TECHNOLOGY** Aside from her academic research, Sara also coordinates and co-leads Swinburne's unique student space challenge programs, sending student led experiments to the International Space Station. This Australian wide program gives students insight into a space science career.
9.40am	**ROTATION ONE - 40 min parallel sessions** >> Teacher only Mini-Masterclasses >> Student and/or Teacher DigiDesign hands-on workshops & STEAM Expo
10.20am	**MORNING TEA -** An opportunity to network with other teachers and students, and explore EXPO
11.50am	**PROBLEM SOLVERS DESIGN CHALLENGE - 80 min parallel sessions** >> Design challenge sessions for Year 4 to 10 students and teachers
10.50am	**TEACHER ALTERNATE SESSIONS** >> 80 min Teacher only Mini-Masterclass ◦ Reimagining STEM: Definitions and Disruptions >> 80 min Teacher Networking and STEM Pathways session ◦ Opportunity to connect with other teachers and presenters to share ideas, possibilities and practices. Meet with the sponsors in the STEM Expo area to discuss (without students) how they can support you in delivering and inspiring STEM in your school
12.10pm	**LUNCH -** An opportunity to network with other teachers and students, and explore EXPO
12.50pm	**KEYNOTE SPEAKER - DR PRUE FRANCIS** **MARINE SCIENTIST AND SUPERSTAR OF STEM, SCHOOL OF LIFE AND ENVIRONMENTAL SCIENCES, DEAKIN UNIVERSITY** A former high school teacher and now marine scientist and educator at Deakin University, Prue is exploring the extent to which ocean literacy is being taught in schools across Australia and evaluating innovative methods to enhance ocean literacy.
1.20pm	**STUDENT PANEL – FACILITATED BY DR PRUE FRANCIS**
1.40pm	**ROTATION TWO - 40 min parallel sessions** >> Teacher only Mini-Masterclasses >> Student and/or Teacher DigiDesign hands-on workshops & STEAM Expo
2.30pm	**FEEDBACK AND CONFERENCE COMPLETION** >> Awarding of prizes to attendees >> Completion of feedback form
2.45pm	**CLOSE OF THE CONFERENCE**

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Spark STEM Conferences

THURSDAY 24 OCTOBER 2024
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