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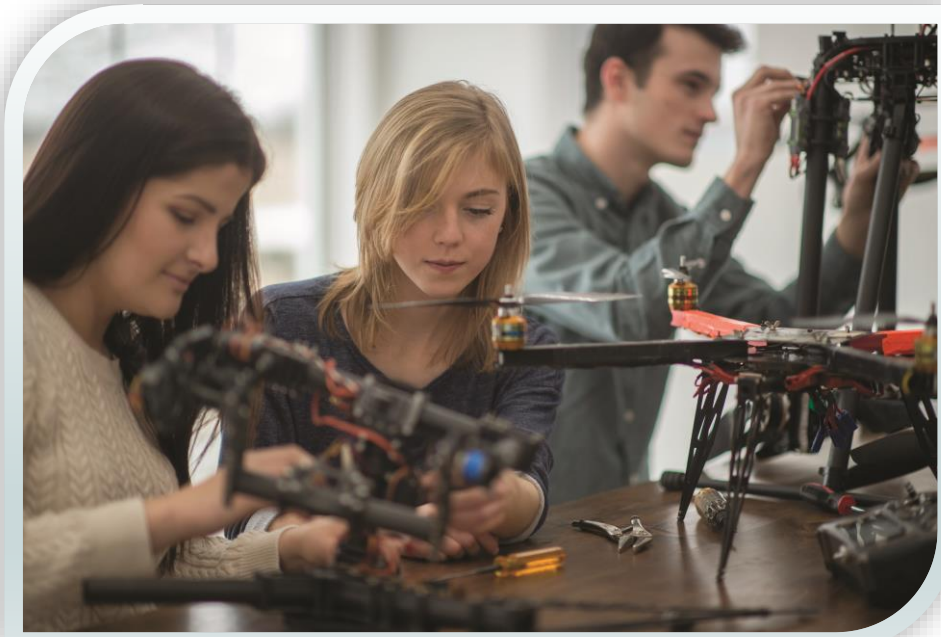
Mobile Tech School Program Offerings 2023



As we move into 2023, and the Gippsland Tech School continues to work with partner schools in Wellington and East Gippsland shires, we are excited to release our program offerings for the year. These programs reflect the curriculum, as co-designed with our partner schools, as well as new programs we believe will be important for students' futures. A huge amount of thanks goes to all the teachers who have helped us with this development. Our experiences to date, have helped to shape our curriculum design and we will continue to increase our focus on providing the best learning experience possible for students in the programs we offer. If you are needing customisation within any of our offered programs, or have a suggestion for future program development, please contact our Mobile Tech School facilitator, Dr Warren Stannard: warren.stannard@gippslandtechschool.vic.edu.au

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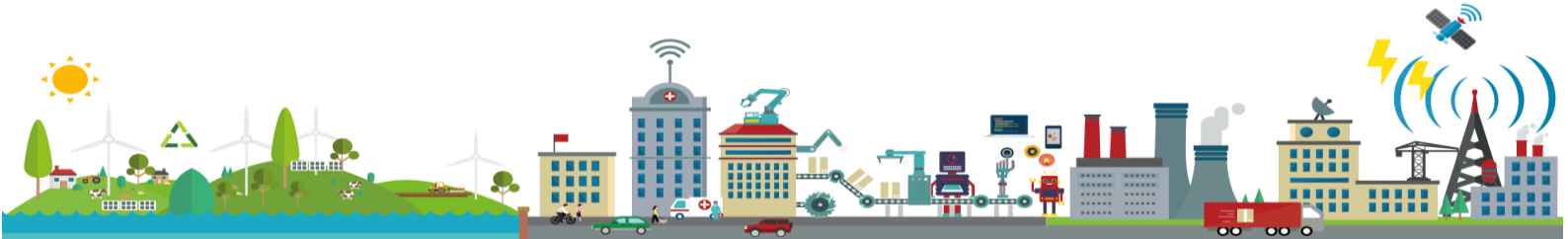
Year 7 – 8	Digital Art – Making Movies Using a range of film and sound technologies, students will be challenged to harness their creativity to create their own short film and soundtrack.
	Everyday Maths Students will investigate everyday mathematical principles in a range of practical activities and participate in experiments to collect and analyse data from everyday tasks.
	Hands on Science This program will expose students to careers in Science and plant the seed for a future career in STEM. They explore how technology is influencing Space Science and Exploration, learn about the solar system and. complete experiments with light, using a spectrophotometer to study what's in water and investigate the models of matter.
	Industry Tech Taster Students will learn about how technology is changing the world of work and why these matters to them. They will rotate through activities that will expose them to industry changing technologies and new ways of problem solving.
	Sustainable Futures Students will be introduced to different types of renewable energy and investigate the advantages and disadvantages of each. They will conduct experiments using solar, wind, and hydrogen energy, expanding their knowledge of energy types and energy conversions. Students will also investigate the design features of energy efficient buildings and carry out experiments to determine the best materials to use and explore other energy saving practices. .
Year 9 - 10	3D Modelling & Design (Temporarily unavailable) Using their maths and design technology skills, students will investigate a solution to a practical problem, sketch a design and digitally create a 3D model that they will then manufacture using a 3D printer.
	Advanced Everyday Maths Students will further develop and investigate everyday mathematical principles in a range of practical activities and participate in experiments to collect and analyse data from everyday tasks.
	Sports Science The impact of advancing technology and innovation is changing how we train and play sport. In this program, students will explore how science and technology are impacting the sports and fitness industries. Through hands on activities, students will experience new ways to exercise and assess performance and understand the impact of new and developing technology on sport and exercise.
VCE	Physics This program explores topics in Physics for year 10 – VCE students. Part A - **The wave nature of light:** Students will conduct experiments, collect, and analyse data before recreating Thomas Young's famous double slit experiment. Part B - **Kinematics**: Students will investigate the motion of a cart along an inclined track to gain an understanding of Newtons Laws and the relationship between parameters such as displacement, velocity, and acceleration.



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Digital Art – Making Movies

INDUSTRY FOCUS AREA: Advanced Manufacturing

VICTORIAN CURRICULUM LINKS: Digital Technologies, Drama, English, Media Arts, Music and Visual Arts

TECHNOLOGY USED: iMovie and Stop Motion software on iPad, iPads, Digital Audio Workstation (DAW) software, Lego and design materials

YEAR LEVEL: 7 – 8

DURATION: 2 – 5 hours

CLASS SIZE 30

Introduction

The link between art and technology is not always clear; there are many varied career paths available for creatives in technology centric fields and a diverse range of creative industries that use advanced technologies to achieve outcomes. Students are often unaware these careers exist, and what skill sets and education are required to excel in the fields. This program hopes to start addressing that.

Program Summary

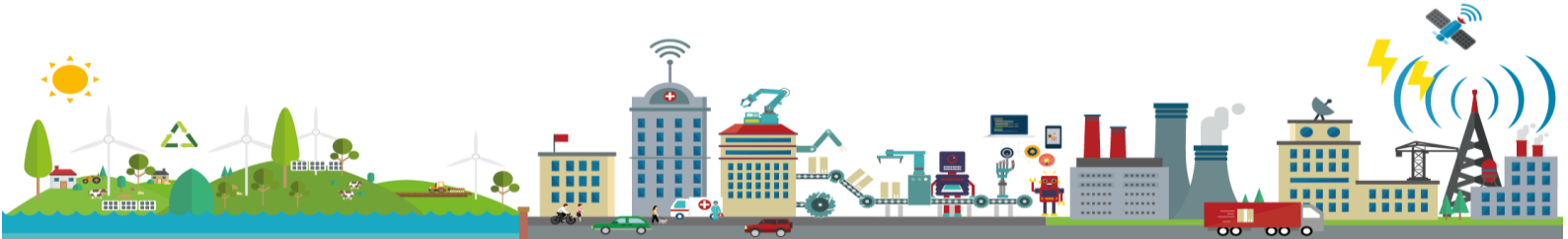
Students will be challenged to harness their creativity in this program as they create their own original short film and soundtrack
They use media technologies and extend the use of media elements such as sound, movement, and lighting.
They will use a range of film and sound technologies as they explore planning, composition, and creation of short films.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Digital Art - A	1-2 hours	• Create a short animation or film clip using iMovie and Stop Motion software on iPad
Digital Art - B	Additional 1 hour	• Edit animation or film clip using iMovie and Stop Motion software on iPad
Digital Art - C	Additional 1 hour	• Investigate the use of digital audio techniques – composing, recording, arranging, mixing and mastering
Digital Art - D	Additional 1 hour	• Create a short musical piece as a soundtrack for their animation or film clip • Present their piece to an audience
NOTE: The lighting and sound sessions can be run on subsequent days / visits to better fit with individual school timetabling if desired.		

Career Links:

Web Designer, Film and Video Editor, Industrial Designer, Multimedia Artist, Animator, Medical Illustrator



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Everyday Maths

INDUSTRY FOCUS AREA: All

VICTORIAN CURRICULUM LINKS: Mathematics, Personal & Social Capability, Critical & Creating Thinking, Design and Technologies, Music

TECHNOLOGY USED: Jump mats, Speed Gates, iPads – bicycles and exercise bikes

YEAR LEVEL: 7 - 8

DURATION: 1 – 4 hours

CLASS SIZE 30

Introduction

Mathematics is not just an abstract activity but is present in everyday activities and is a useful tool to understand the world around us. Mathematics is everywhere – it can be used to analyse data, identify, and predict patterns, and is a vital tool in developing problem-solving skills. It is an indispensable tool in many professions – engineers and scientists could not operate without it; it is important for chefs, chemists, builders, accountants, and nearly every profession one could imagine.

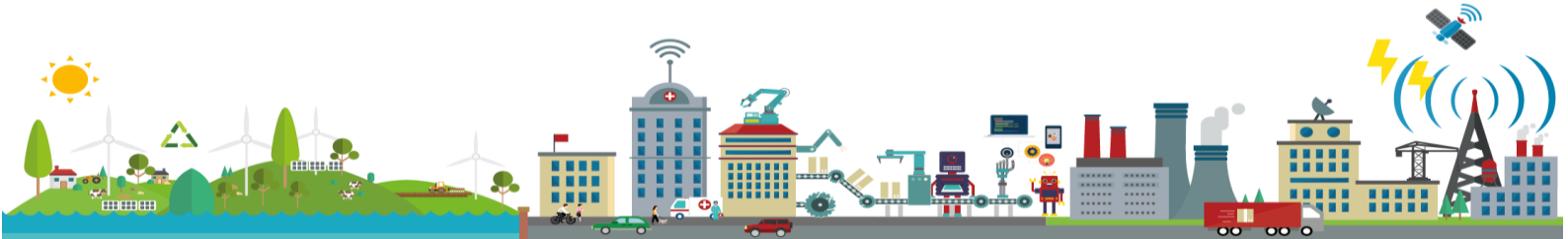
Program Summary

Students will investigate mathematical principles in a range of practical activities. They will partake in experiments of collecting and analysing data.

Activities will involve sports equipment.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Everyday Maths - A	1 hour	• Use a jump mat to determine the relationship between time of flight and height jumped • Use a spreadsheet on an iPad to perform multiple repetitive calculations on flight time data collected during the class • Participate in short practical activities / brain teasers that explore the concept of exponential growth and gravity
Everyday Maths - B	1 hour	• Use speed gates to investigate the relationships between distance and speed • Use a spreadsheet on an iPad to perform multiple repetitive calculations on run through data collected during the class • Participate in short practical activities / brain teasers that explore the concept of problem solving from different perspectives and lateral thinking
Everyday Maths - C		• Use a regular bicycle to determine the relationships between gears, speed and distance. • Use a spreadsheet on an iPad to perform multiple repetitive calculations on data collected during the class • Participate in short practical activities / brain teasers that challenge students to think laterally in order to solve practical problems.
Everyday Maths - D	1 hour	• Use an advanced exercise bike to determine the relationships between gears, effort and power output. • Use a spreadsheet on an iPad to perform multiple repetitive calculations on data collected during the class • Participate in short practical activities / brain teasers that challenge students to think laterally in order to solve practical problems.
NOTE: Each session can be run independently of the others if required.		



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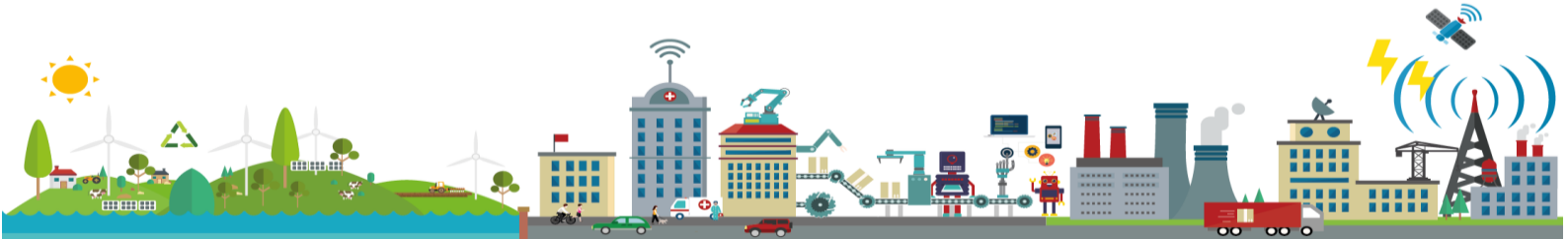
Career Links:

Artisans:	Machine operators, electricians, carpenters, chefs etc.
Designers:	Architects, draftspersons
Engineers:	Civil, construction, electrical, mechanical
Scientists:	Chemists, physicists, biologists, sports scientists, environmental scientists
Professionals:	Accountants, sports coaches, health care etc.



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Hands on Science

INDUSTRY FOCUS AREA: Space Science, Engineering,

VICTORIAN CURRICULUM LINKS: Science, Digital Technologies, Personal and Social Capability, Critical and Creative Thinking

TECHNOLOGY USED: Virtual reality, iPads, Advanced Scientific Equipment

YEAR LEVEL: 7 - 8

DURATION: 1 – 4 hours

CLASS SIZE 30

Introduction

Science allows us to answer interesting and important questions about the biological, physical and technological world. Science allows us to make sense of our world by exploring the unknown. Science challenges us to investigate universal mysteries, make predictions and solve problems. Scientific knowledge is contestable and is revised, refined and extended as new evidence arises. Hands on Science provides opportunities for students to understand important concepts and processes. Hands on Science introduces students to the practices used to develop scientific knowledge, the contribution of science to our culture and society, and its applications in our lives. Possessing such skills allows students to make informed decisions about local, national and global issues and to pursue science-related careers if they elect to.

Program Summary

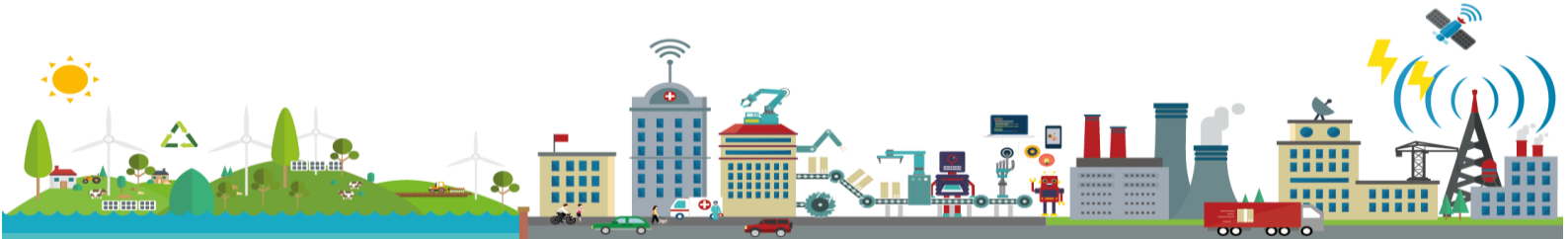
This program will expose students to careers in Science and plant the seed for a future career in STEM. Students will learn about the unique position of Earth in the solar system and consider the use of mixed realities in learning about Space and training astronauts. They will learn about the solar system, do experiments with light and use a spectrophotometer to study what's in water and investigate the models of matter.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Hands on Science - A	1 hour	• Use headsets to explore Space virtual reality (VR) experiences
Hands on Science - B	1 hour	• Use an optics kit to understand the principles of light
Hands on Science - C	1 hour	• Use a UV-VIS spectrophotometer to study what's in water to determine it's suitability for use in agricultural, industrial, domestic, environmental or ecological purposes
Hands on Science - D	1 hour	• Use X-Ray Fluorescence (XRF) to demonstrate the relationships between atoms, molecules and how these form the properties of everyday materials

Career Links:

Space Science, Engineering, Robotics, Computing, Space Medicine, Communications.



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Industry Tech Taster

INDUSTRY FOCUS AREA:	Advanced Manufacturing, Food & Fibre, Health
VICTORIAN CURRICULUM LINKS:	Digital Technologies, Personal and Social Capability, Critical and Creative Thinking
TECHNOLOGY USED:	Laser cutter, Virtual reality – Oculus Quest, Thymio robots, iPads and drawing design software
YEAR LEVEL:	7 - 8
DURATION:	2 – 4 hours
CLASS SIZE	30

Introduction

Technology is a disruptive force which has always led to changes in the way that people work and the types of jobs that are in demand. This change is happening more and more rapidly with the increased pace of technological development. We have seen changing technologies and a reduction in traditional industries have a dramatic impact on Gippsland. This means that today's students need to develop skills that will allow them to be adaptable and to meet unforeseen challenges and opportunities in their lives. They also need to be open to new experiences and to understand how the world of work is changing around them.

Program Summary

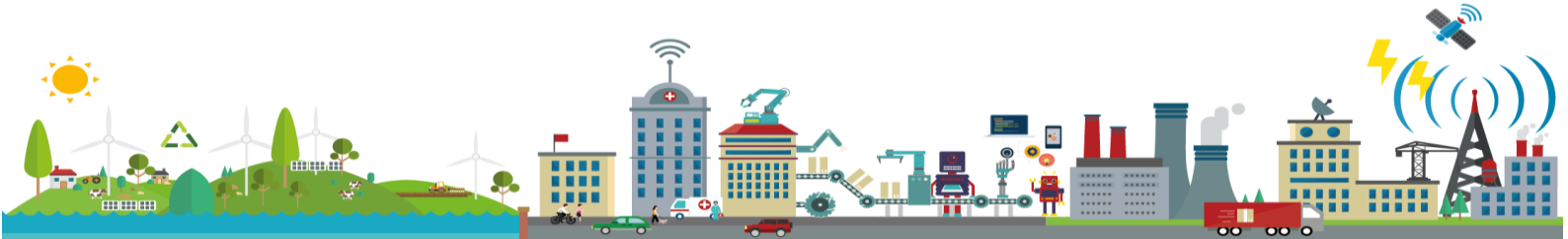
The program will begin with students learning about how the world of work is changing and the skills that will be most important for them as they move into the workforce. Students will then rotate through three activities which will expose them to industry changing technologies and new ways of problem solving. Students will collaboratively automate robots in a farm to market challenge, use Design Thinking to create for each other using advanced manufacturing, and experience how digital realities are being used in workplaces.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Industry Tech Taster - A	0.5 -1 hour	• Use headsets to explore various virtual reality (VR) experiences
Industry Tech Taster - B	0.5 - 1 hour	• Program / code robots to solve real world problems
Industry Tech Taster - C	1 hour	• Use the Design Thinking process to design and create using advanced manufacturing (Laser or Vinyl Cutter, Design Drawing software on iPads)
Industry Tech Taster - D	1 hour	• Use electronic kits to build a small "machine" to solve a simple practical problem.
NOTE: Each session can be run independently of the others if required, or Industry Tech Taster A and B can be combined into a one hour session, by splitting the class in two and swapping over after 30 minutes or so.		

Career Links:

Designers: Civil Engineer, Product Tester, Electrical Engineer Technologists: Programmer, Software Engineer, ICT Analyst



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Sustainable Futures

INDUSTRY FOCUS AREA: New Energy, Advanced Manufacturing

VICTORIAN CURRICULUM LINKS: Science, Digital Technologies, Personal & Social Capability, Critical & Creating Thinking

TECHNOLOGY USED: Renewable energy kits – wind turbines and solar panels, Hydrogen electrolysis and fuel cells, infra-red thermal imaging cameras, STELR sustainable housing kits, iPads.

YEAR LEVEL: 7 - 8

DURATION: 1 – 5 hours

CLASS SIZE 30

Introduction

Sustainability can be defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. A key part of a sustainable future is building more resource efficient homes. Using good design principles can save energy, water, and money while creating a more enjoyable and comfortable home. There is also worldwide pressure to reduce CO2 emissions and move towards renewable energy sources. The Victorian government has set a target of 25% renewable energy production by 2020, increasing to 40% by 2025[i]. New industries are proposed for the Gippsland region including OSMI wind farms, solar farms, Star of the South offshore wind turbines, and the Marinus electricity link between Tasmania and Victoria.

Program Summary

Students will be introduced to a variety of different types of renewable energy. They will investigate the advantages and disadvantages of solar, wind, and hydrogen energy, conducting experiments with each energy type. Students will expand on their knowledge of energy types and energy conversions. Students will look at energy efficient building design. They will be introduced to principles of heat flow and energy conversion. They will investigate the insulation properties of various building materials and the use of different glazing treatments. They will design and build a model house.

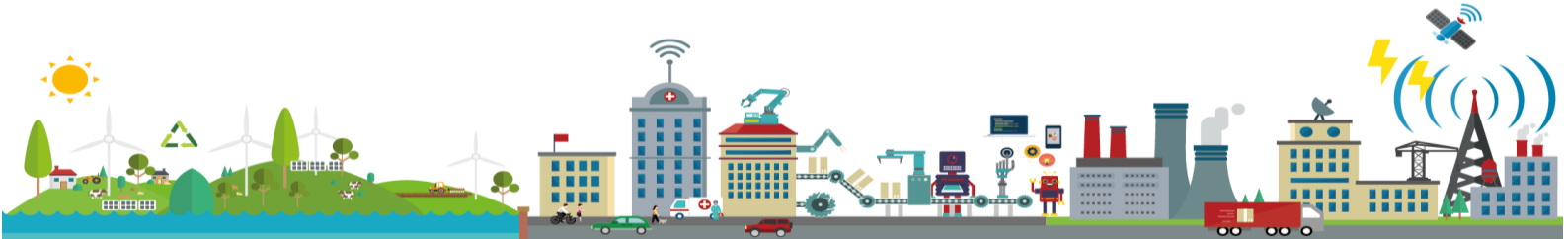
Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Sustainable Futures - A	1 hour	• Using a specialised kit, generate hydrogen gas from the hydrolysis of water. Pass hydrogen gas through a fuel cell, to power a small vehicle.
Sustainable Futures - B	1 hour	• Experiment with various blade designs / configurations to build a wind turbine that produces the most energy.
Sustainable Futures - - C	1 hour	• Using photovoltaic cells students will investigate the application of solar energy as a renewable energy source
Sustainable Futures - D	2 hours	• Glazing and insulation experiments • Use infra red cameras to determine sources of heat loss in buildings • Apply design principles to select the most appropriate building materials and site orientation for an energy efficient building.

Career Links:

Artisans: Machinery operators, builders, electricians, carpenters
Designers: Architects, product testers, interior designers, draftspersons
Engineers: Civil, construction, electrical

[1] https://www.energy.vic.gov.au/renewable-energy/victorias-renewable-energy-targets



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3D Modelling and Design

INDUSTRY FOCUS AREA: Advanced Manufacturing (Temporarily unavailable)

VICTORIAN CURRICULUM LINKS: Mathematics, Design and Digital Technologies, Critical & Creative Thinking, and Digital Technologies

TECHNOLOGY USED: iPads and Shapr3d software, 3D printer (or Laser Cutter)

YEAR LEVEL: 9 - 10

DURATION: 2 - 4 hours

CLASS SIZE 30

Introduction

The world of digital design is is opening up to students due to new 3D printing technologies and user-friendly software. Students interested in design, artists, architects or engineers, will need to understand 3D modelling software to get ahead. The ideas you have won't go far without the right tools. There's nothing more frustrating than having a great idea that you can't turn into a model. 3D models engage your audience and help them see your ideas and designs. Affordable 3D printers allow your ideas and designs to be translated into real models.

Program Summary

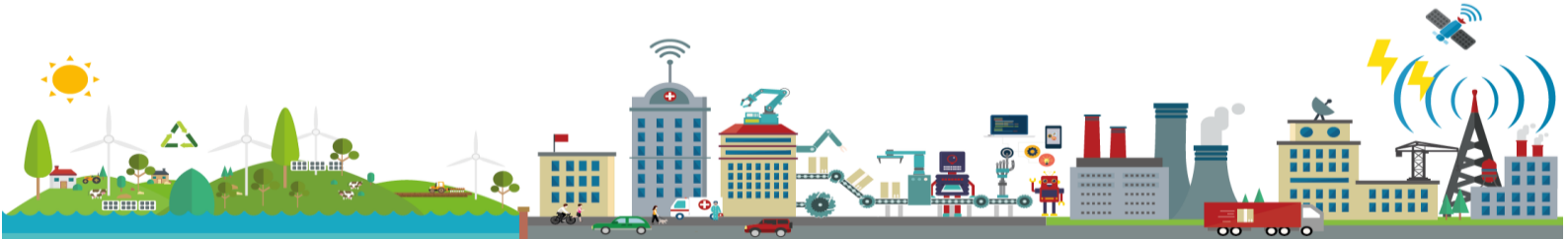
In this program, students will be presented information from a 'client' who requires a solution to a need. They will use their maths and design technology skills to design a piece that could be used to solve the practical problem that they have identified. They will sketch a solution, adjusting as necessary. They will then design and manufacture their product using the 3D printer or Laser Cutter.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
3D Modelling and Design- A	1 hour	• Design software tutorial • 2D Design of 3D item • Cut out 2D Design on Laser Cutter • Assemble design • Students will be able to take their design home with them.
3D Modelling and Design- B	1 hour	• Design software tutorial • Design 3D item • Item printed on 3D Printer* • Students will be able to take their design home with them.
NOTE: *3D printing is a slow process. Designs can be printed on the 3D printers located at the Mobile Tech School's Morwell premises, and mailed to the school, or delivered to the school on the next scheduled visit.		

Career Links:

Designers, Architects, Engineers, Technologists, Artisans.



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Advanced Everyday Maths

INDUSTRY FOCUS AREA: All

VICTORIAN CURRICULUM LINKS: Mathematics, Personal & Social Capability, Critical & Creating Thinking, Design and Technologies, Music

TECHNOLOGY USED: Technical equipment, iPads – Numbers and Sound Recording software.

YEAR LEVEL: 9 - 10

DURATION: 1 – 4 hours

CLASS SIZE 30

Introduction

Mathematics is not just an abstract activity but is present in everyday activities and is a useful tool to understand the world around us. Mathematics is everywhere – it can be used to analyse data, identify, and predict patterns, and is a vital tool in developing problem-solving skills. It is an indispensable tool in many professions – engineers and scientists could not operate without it; it is important for chefs, chemists, builders, accountants, and nearly every profession one could imagine.

Program Summary

Students will investigate mathematical principles in a range of practical activities. They will partake in experiments of collecting and analysing data.

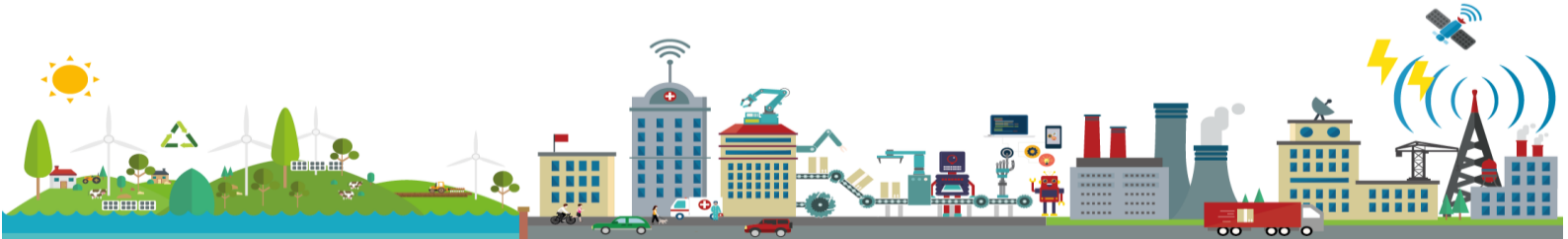
Activities will involve technical equipment, music scales and sound frequency.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Advanced Everyday Maths - A	1 hour	• Use technical equipment to determine rates of change • Use a spreadsheet on an iPad to perform multiple repetitive calculations and create graphs using the data collected during the class • Participate in short practical activities / brain teasers that explore the concept of exponential growth and gravity
Advanced Everyday Maths - B	1 hour	• Use a spreadsheet on an iPad to perform probability and statistics calculations on data collected using technical equipment during the class • Participate in short practical activities / brain teasers that explore the concept of problem solving from different perspectives and lateral thinking
Advanced Everyday Maths - C	1 hour	• Pythagorus' Theorum will be demonstrated by manipulating 2D shapes created by a Laser Cutter
Advanced Everyday Maths - D	1 hour	• Use Garage Band software on iPad to explore the relationship between notes in a music scale and frequency •
NOTE: Each session can be run independently of the others if required.		

Career Links:

Artisans: Machine operators, electricians, carpenters, chefs etc.
Designers: Architects, draftspersons
Engineers: Civil, construction, electrical, mechanical
Scientists: Chemists, physicists, biologists, sports scientists, environmental scientists
Professionals: Accountants, sports coaches, health care etc.



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Sports Science

INDUSTRY FOCUS AREA:	Sports Science, Exercise and Health sciences
VICTORIAN CURRICULUM LINKS:	Health and Physical Education, Digital Systems, VCE PE UNIT 1, Area of Study 2 UNIT 3 Area of Study 2
TECHNOLOGY USED:	Jump mats, speed gates, iPads, Cosmed K5 Portable VO2 Max Testing Equipment, Biomechanical Analysis Software, Heart Rate Monitors, Virtual and Mixed Reality.
YEAR LEVEL:	9 – 10 (and VCE)
DURATION:	1 – 4 hours
CLASS SIZE	30

Introduction

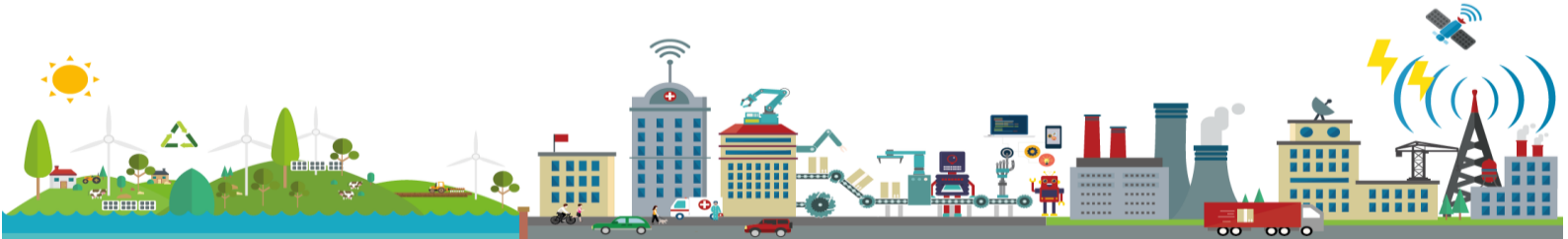
The impact of advancing technology and innovation is changing how we train and play sport. In this program, students will explore how science and technology are impacting the sports and fitness industries. Through hands on activities, students will experience new ways to exercise and assess performance and understand the impact of new and developing technology on sport and exercise.

Understanding how the cardiovascular and respiratory systems work together to meet the demands of the body during exercise is critical to evaluating fitness and performance, particularly at elite levels of sport. The VO2 max test gives accurate information on physiological changes during exercise and is an effective way to test cardiorespiratory fitness.

Program Summary

Students will explore how science and technology are impacting the sports and fitness industries. Through hands on activities, students will experience new ways to exercise and assess performance and understand the impact of new and developing technology on sport and exercise. This program is designed as an introduction to new technologies relating to sport and exercise, and to increase awareness of careers in Sports Science.

In this program, students will undertake or observe a VO2 max test using industry standard testing equipment. Students will evaluate the data obtained by the test to understand the changes that occur in the body during intense exercise, and how this information can be useful to athletes.
Students will observe the cardiovascular and respiratory systems in virtual and mixed realities to see gas exchange in action and view blood flow around the body.



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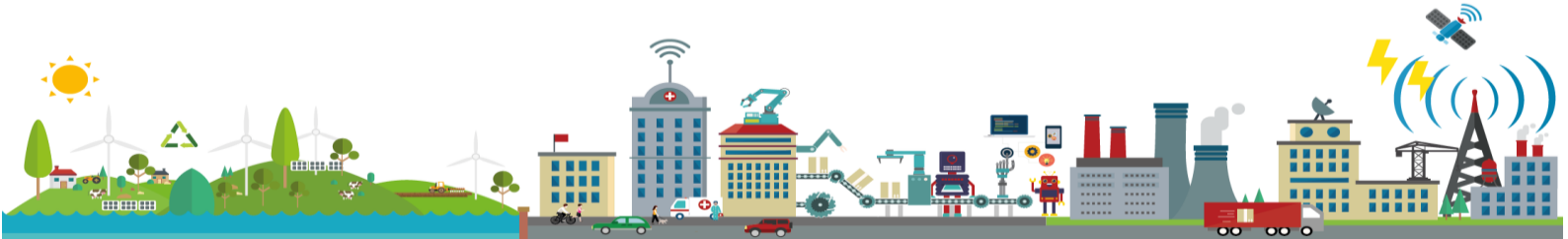
Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Sports Science - A	1 hour	• Use sensors to assess speed and jump height • Participate in activities to assess speed, agility and decision-making under simple and complex scenarios
Sports Science - B	1 hour	• Complete a workout in virtual reality
Sports Science – C*	1 hour	• Test cardiorespiratory fitness using clinical VO2 max testing equipment*
Sports Science - D	1 hour	• Investigate the biomechanics of human movement using advanced sensors and interpret data using analysis software
NOTE: *Sports Science C requires participants to complete a ***compulsory*** Parental Consent and Medical Release Form prior to commencement. In a one hour session, approximately 3-4 students can be processed through the VO2 max equipment. It is recommended that Sports Science A or B be run in conjunction with Sports Science C.		

Career Links:

Health Professionals, Sports Scientists, Exercise Professionals, Data Analysts, Sport Technologists. Physiotherapist, Sports Medical Professionals, Exercise Physiologist,



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Physics

INDUSTRY FOCUS AREA: All

VICTORIAN CURRICULUM LINKS: VCE Physics, Specialist Maths

TECHNOLOGY USED: Waves on a wire kit, lasers, optics kits, gravity carts and tracks, iPads and associated software

YEAR LEVEL: 10 - VCE

DURATION: 1 – 2 hours

CLASS SIZE 20

Introduction

What is light? This question has baffled physicists and scientists for hundreds of years. In the 19th century light was described as a wave travelling through a medium. Thomas Young's famous double slit experiment provided strong confirmation of the wave model of light. In 1905 Einstein proposed that light consisted of small quanta of energy, later named photons. These two seemingly incompatible models are still used to describe the various characteristics of light and is often referred to as wave/particle duality.

Program Summary

In this program, students will investigate one of the following:

What is Light?
Students will investigate the properties of waves on a string. They will take measurements and create standing waves in a wire, modifying the arrangement to produce various harmonic oscillations. Students will then re-create Young's experiment and determine the width of a single hair by measuring the separation of lines in an interference pattern.

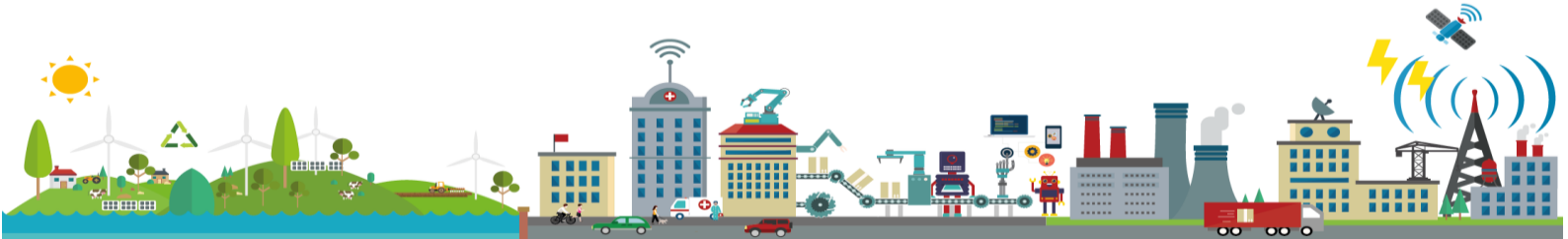
Kinematics
Students will investigate the motion of a cart along an inclined track to gain an understanding of Newtons Laws and the relationship between parameters such as displacement, velocity, and acceleration.

Taking part in this program, students will collaboratively:

Program	Duration of session	Activity completed
Physics - A	1 hour	• Investigate properties of waves on a string. • Measuring width of human hair by measuring the separation of lines in an interference pattern.
Physics - B	1 hour	• Investigate motion of a cart on an inclined track to gain an understanding of Newton's Laws and the relationship between displacement, velocity and acceleration.

Career Links:

Engineers: Civil, construction, electrical, mechanical
Scientists: Chemists, physicists, biologists, sports scientists, environmental scientists, medical



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