

ISSUE

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Program Update

The South Australian Advanced Technology Project (ATP) is a joint initiative of the Commonwealth and state governments that aims to increase the number of students studying STEM (science, technology, engineering and mathematics).

The ATP is funded by the Commonwealth Department of Defence and managed by the Department for Education and Child Development.

We announced in the last edition that the program was going to be reviewed by the Centre for Defence Industry Capability (CDIC). We are still awaiting the outcome of the review, however we are continuing with 'business as usual' with current funding until 30 June 2017.

We are confident that the excellent results achieved over the life of the project will be recognised and we will continue to advance this project, which has helped develop and support a positive STEM culture in South Australian schools.

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ADVANCED TECHNOLOGY PROJECT

Lorien Goddard, Andrew Rogers, Megan Jones, Matthew Rankine

Real life challenges at Reynella

Year 9 STEM students at Reynella East College were recently given the opportunity to solve a couple of real life challenges and then present their findings to South Australian-based manufacturers, designers and sellers, REDARC Electronics.

Students were asked to address 2 challenges – bending field-effect transistors (FETs), which are currently handled manually and is quite a time consuming process, and another manual process, the reloading and reconfiguring of machines in Redarc's surface mount technology room.

"The students visited Redarc to see the issues first hand, interviewed the staff who face the challenges daily and took away some components so they could do some further testing at school and come up with their own solutions," said Lorien Goddard, Senior SMT Process Technician at Redarc.

The solutions offered by the students were tested and carefully considered, with a plan to incorporate a new jig designed to bend FETs that does not rely on an operator to carry out the task.

Redarc also has plans to incorporate an electronic visual aid system to alert machine operators when the machines are ready to be set-up.

"The ideas presented by the students enabled us to improve our design and potential system," said Lorien.

This style of learning allowed the students to work in teams and develop the skills required for their future careers.

Redarc will continue to provide opportunities to high school students, particularly in STEM subjects to see how industry works.

"Thanks to the students from Reynella East College for participating and then presenting their findings to us. We hope their learning experience has fostered a thirst to continue pursuing a STEM-related career – who knows, maybe one of them will be next bright star to join the Redarc team?" Lorien said.

REDARC



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Defence Industry Pathways Program reaches milestone

By the end of 2016, 100 students had completed this ground-breaking defence course, with several students already progressing to further studies in engineering.

The DIPP 9 and DIPP 10 courses have now finished and the DIPP 11 course is currently running with the graduation ceremony to be held on 4 July this year. The DIPP 12 will begin later this year in semester 2.

DIPP teacher, Eddie Grzeskowiak, said that the course has been a great success. *"The results and personal development of the students has been amazing. Each year they increase the level of complexity in their designs,"* he said.

Students also complete a SACE Stage 1 Design and Technology 10 credit unit course that includes CAD design and 3D printing. In addition, through the DIPP courses students develop knowledge and skills in advanced manufacturing technologies while completing practical activities

"It never ceases to impress me the talents and skills of our young students, not simply because of their ability to do these tasks but also their ability to keep up with their personal school commitments as well," said Eddie.

DIPP 10 in 2016 had the largest number of girls in one group to date. *"Their excellent applications hinted that they would do well,"* said Eddie, *"and this was confirmed with their exceptional ability to grasp the CAD and 3D concepts. The products they produced set a new standard for other groups to follow, leading to some very creatively printed submarines and AWDs."*

Minister for Education and Child Development, Susan Close visited the class in November 2016 and listened to a short outline of the DIPP program and SACE components by the TAFESA lecturer, Anthony Tonkin and DIPP SACE teacher, Eddie Grzeskowiak from Le Fevre High School. This was followed by student presentations on the AWDs, submarines and SACE tasks within the course.

"We gave the minister a tour of the workshop and the 3D printer in action, and showed her a presentation of a 3D-printed submarine by Summer Hill, from Mitcham Girls School. We understand the submarine is now on display in the minister's office," said TAFE Lecturer, Anthony Tonkin.

Anthony urges staff and students who have an interest in engineering and 3D modelling to submit an application for future Defence Industry Pathways Program courses when they become available.



Summer Hill with Minister Susan Close

e-bikes@Woodville High school

Year 11 students at Woodville High School are using the engineering design process to build their own e-bike prototypes as part of a SACE stage 1 Systems and Control Technology course.

An e-bike has motorised assistance that allows the cyclist to ride further with less effort.

"David Mace, the technology teacher at Woodville is teaching his 24 students how to design and construct their own e-bikes to be used in trials to test an original formulated hypothesis," said Fiona Pettinau, Science/STEM Coordinator at Woodville High School.

"Students learn about building their own customised e-bike as a way of protecting the environment, saving money, a more efficient way of transport or just a fun way to get around," she explained.

Students work in teams to develop their ideas and build their prototypes, both recumbent and upright. Some have even set up their ideas as a small business and are developing their entrepreneurial skills.

Fiona Pettinau
Science/STEM Coordinator
Woodville High School



Students working on their e-bike

Seaton High School students learn sustainable building design

An exciting new year 9 subject was introduced at Seaton High this year, where students get to integrate the areas of science, technology, engineering, art and mathematics (STEAM).

Tom Griffith, STEM Coordinator at Seaton, said that the subject involves students working collaboratively to redesign the school library into an environmentally sustainable 21st century learning space.

"Students talk with industry experts and use their knowledge and understanding of sustainable building design gained in STEAM subjects to design and produce architectural blueprints, a CAD drawing and an accurate 50:1 scale model of their proposed library redevelopment," explained Tom.

Students are focusing on various central questions such as how they use student and teacher voices to collect data about the function, purpose and needs of the new learning space, and how they use environmental and sustainable building practices to create a structure that is harmonious with the surroundings and evokes peace, tranquillity and restfulness.



"So far in just 4 weeks, the students have learned more about the engineering design cycle, used their understanding of carbon footprints from science to re-engineer and re-purpose discarded plastic bottles – they have worked collaboratively to design, devise, critique and re-engineer their project, and then presented their project to their peers," said Tom.

Students then worked with engineering industry experts, Lockheed Martin to expand their knowledge of the engineering design cycle and learn about exciting STEAM pathways of the future.

Tom Griffith
STEM Coordinator
Seaton High School

Viking sun compasses inspire STEM thinking

Vikings routinely crossed the North Atlantic without a magnetic compass and left their mark on lands as far away as Greenland, Newfoundland and Baffin Island. Based on an eleventh-century dial fragment artefact, (known as the Uunartoq disc) found in Greenland in 1948 in an 11th century convent, it is widely accepted that they sailed along chosen latitudes using primitive sun compasses.

"The history of navigation is part of our year 12 Naval Engineering Curriculum at Le Fevre High School," said ATP Manager, Thierry Herman. *"As part of their assignments and after learning how to use Corel Draw and the laser cutter, students recreate a viking sun compass."*

The compass works on the principle that the tip of the shadow of a perpendicular style (gnomon) to a plate describes a curve that does not vary much over the course of a few days, provided the ship stays at the same latitude (parallel).

Since Vikings mainly travelled west to reach Greenland and Iceland, they could prepare



a sun compass just before setting sail by recording the different positions of the style shadow, every hour for a day.

"Our students did this over the course of one day at school. In normal operation, you simply need to turn the compass for the tip of the shadow to just contact the recorded line. The compass then points to true (geographical) north every time. Students designed and printed their compass rose with Corel Draw and produced their circular plate and style on the laser cutter," explained Thierry.

"They had a great time designing their sun compass, getting a glimpse into the minds of people who, more than a thousand years ago, did not have computers or CNC machines, but who operated with a scientific frame of mind."

STEM discover days for primary schools

As part of the school's STEM focus, Le Fevre High School is regularly holding STEM discovery days for partner primary schools.

The days are organised to rotate primary school students between 3 workshops to show the school's STEM philosophy. This year, Eddie Grzeskowiak, Le Fevre Maritime Leader and Technology Coordinator, developed a new and original rubber band powered paddlewheel model boat for visiting students.

"We had 3 year 7 classes from West Lakes Shores Primary School in late March and a class from North Heaven Primary School in early April," said Eddie.

"This project involves students understanding the naval engineering principles underpinning the design and conception of marine machines," explained Eddie. The principles of buoyancy and stability are combined with advanced technologies such as design software and laser cutting for the students to produce their paddlewheel. They use traditional tools in the wood workshop to produce the hull/platform system to house their propulsion system.

"These discovery days have been very successful with students and teachers making their own boats. Many students made high-quality products, and it was quite clear that a lot of thought had gone into optimising the shape of their hulls and the efficiency of their motors," said Eddie.

"There was also the excitement of the races at the end of the day, where we watched the fastest boat reach impressive speeds for a rubber band powered craft. Students were really engaged and now have a better idea of the STEM principles and philosophy going into designing and manufacturing modern-day products."

Thierry Herman
Manager, ATP
Le Fevre High School



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Inside the United States Space Academy

Year 11 student, Simon Lieu from Playford International College, has been on an out-of-this-world trip after attending the United States Advanced Space Academy.

For Simon and his long life goal of becoming an astronaut, this has been a dream come true to experience what it is truly like to train as an astronaut.

In addition to the week-long Advanced Space Camp at the US Space and Rocket Center, in Huntsville, Alabama Simon also visited South Korea, Los Angeles and San Francisco for significant technology, science and space attractions. Read Simon's experience below:

WOW! Where do I start? This was truly the best experience of my life. I remember first hearing about this camp during the Australian National Space Camp and looking back, taking that first step in getting selected has been one of the best decisions I have made. Amazingly, I found out that of the 48 students from Australia, I was the only student from South Australia. Knowing that made me nervous but really eager to meet the other students.

America was exciting and fast paced, and overwhelming at times. In addition to our week at Space Camp, we visited California Science Centre in Los Angeles for the Space Shuttle Endeavour Exhibit and looked into the universe with the telescope at Griffith Observatory. We also visited San Francisco for the Exploratorium and NASA Ames Research Centre.

The visit to NASA Ames Research and the Advanced Space Camp were the real highlights of the whole trip. It was amazing to hear a researcher at NASA discuss their current research and how 3D printers work the same in space as on Earth.

For Advanced Space Camp, I met astronaut Robert L Stewart, who was the first person to float in space untethered. I also completed a scuba dive mission, which simulates the environment for microgravity. These exercises for underwater astronaut training are the same practices NASA uses to train its astronauts.

The whole experience has opened my mind about future study and career opportunities as well as my academic and personal skills. The Advanced Space Camp in particular, showcased my main interest in space and was an extraordinary opportunity – I feel so lucky to be chosen. I have formed connections to last a life time, including learning about internships with NASA Ames Research Center.

I have met fantastic new people from all over the world and have really changed my perspective about my academic education and my future career. I would like to acknowledge and say a huge thank you to my sponsors, including the Advanced Technology project and everyone who has helped to make this trip possible.

Simon Lieu
Playford International High School



Simon with astronaut Robert L Stewart

Concept to creation new subjects and news

In 2016, 15 ATP schools participated in 52 C2C activities and congratulations to Craigmore High School won both the Wetlands Environment Management and vehicle efficiency challenges.

This year there are an impressive list of *General C2C – Space* theme subjects available for students in South Australia. The subjects are:

- Wetlands Environment Management (WEM)
- Drone Challenge
- Exploration Challenge
- Auto Challenge – Junior
- Auto Challenge – Senior
- Power and Sustainability

These C2C programs can be integrated into both junior and senior Australian Curriculum and SACE, and provide opportunities for industry to work with schools.

STEM Sista has been an extremely successful professional development program for girls,

designed to help young women understand themselves as well as the pathways to an engineering or related career. They learn how and when to apply for positions, how to write a resume and apply for a job.

In 2017 there were 36 nominations for the April program, with further *STEM Sista* programs to be held in May, July and August.

There will also be a defence-themed *STEM Sista* in the near future, thanks to the interest shown by several industry sponsors.

Following the success of *STEM Sista*, a professional development program for boys was also launched last year called *STEM Mista*. It will be held in August, with registrations opening soon.

A *STEM girls* brunch for years 9 to 12 was also held at the Co-Hab at Tonsley, with assistance from *Simulation Australia* who hosted this event.

'Speed dating' sessions with industry for teachers will be introduced in 2017 and held at Adelaide University for teachers who will tour the university and meet industry partners.

For parents of students interested in STEM, there will be a STEM family session at Adelaide University where parents, industry members and academics can chat about trends in industry and career pathways.

Dates for events are available at <http://www.concept2creation.com.au/>



Hidden Figures – women in space inspire girls in STEM

A movie fundraiser, highlighting the role played by 3 African-American women at NASA who were responsible for launching the first successful American space mission, was held in March to promote the Girls in STEM program.

The movie Hidden Figures features the story of Katherine Johnson, Dorothy Vaughan and Mary Jackson, who were the brains behind one of the greatest space operations in history, the launch of astronaut John Glenn into orbit. This was seen as a stunning achievement that restored America's confidence and turned around the 'space race'.

The fundraising evening was organised by the Advanced Technology Project in partnership with the Institute of Electrical and Electronics Engineers (IEEE), Women in Engineering (WIE SA Branch) and DECD.

Women in Engineering's Dr Gretel Png explained that the 3 women who were the subject of the movie provided NASA with the vital mathematical skills needed to launch the program's first successful space mission. "They are an inspiration and a demonstration of tenacity to all women who wish to succeed in a STEM career pathway," she said.



The evening also promoted the DECD STEM Learning strategy which aims to improve STEM teaching and learning to ensure that public education, in partnership with industry, equips students to take their place in a changing, competitive and interconnected world.

During the evening, astronaut ice-cream and choc-asteroids were sold which, added to the ticket sales, raised more than \$800 to be used to support STEM workshops in rural schools. These workshops have been developed and presented by a group of volunteer female engineers and scientists from Adelaide's tertiary institutions and industries including the defence industries, BAE systems and the DST Group.

Dr Gretel Png said that the IEEE WIE SA branch aims to raise awareness of STEM occupations amongst high school students, especially girls, and encourage them to consider studying STEM subjects in their final years of school, which will ensure they meet the prerequisites for STEM courses at university.

For further information about joining or supporting Women in Engineering contact Dr Gretel Png (University of Adelaide, WIE-SA Chair) via email gretel.png@gmail.com or Victoria Stevens (BAE Systems, WIE-SA Secretary) via email vic.j.stevens@gmail.com

For information see the website
http://ewh.ieee.org/r10/s_australia/

A lot of hot air

A wind tunnel funded under an ATP grant and built by Ian Dewey, the Head of maths and science at Valley View Secondary School, to support projects in physics, programming, maths and the SACE research project was launched at the school's open night in March.



Year 11 physics students being taught how to calibrate the anemometer

"This is a massive leap forward in the level of research that can be done by students in physics and related subjects," said Ian. "For many years Valley View has delivered a physics program focused on UAVs (uninhabited aerial vehicles) and other remote (radio) controlled equipment and robots. Within the program, students built and tested a simple remote control plane. The top students went on to compete at the Concept to Creation UAV competition. This program has left Valley View with a legacy of equipment, resources and expertise," he said.

The new wind tunnel will allow students to increase the depth of their understanding of the physics of flight by studying the flow patterns and forces on wing and foil shapes. Knowledge in these fields will underpin later study in renewable energy (wind farms), aviation and marine applications (propellers, fins, keels and aerofoil sails).

The equipment also opens a range of study opportunities in the SACE Research Project subject, where students will develop the research capabilities of the wind tunnel under the expert mentoring of both RAAF engineers and engineering lecturers from Flinders

University. The research projects will focus on calibrating and modifying scientific equipment, a skill which will help them secure employment in a range of industries in the future.

Physics students at Valley View are part of an integrated program that includes a practical and mentoring program with the Engineering Faculty at the Flinders University Tonsley campus.

Students also have access to further mentoring and leadership training with the RAAF. This structure exposes the students to practical physics at both university and in industry greatly enhancing the experiences gained in the study of physics.

"In 2017 we will continue to develop the wind tunnel, build and calibrate a helicopter simulator and work on a range of other projects including a radio-controlled submarine," said Ian. "Many thanks to the ATP for its support and funding, which has made it possible for Valley View to deliver such useful experiences for students."

Ian Dewey
Manager, Advanced Technology Project
Valley View High School



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Electrotechnology students from left Bryce Morgan, 17, Liam Reynolds, 17 and Jack Rinaldo, 17, with some of the low-energy lights created by student

Hands-on creative design skills at St Pat's

Students from St Patrick's Technical College, in the northern suburbs of Adelaide, have built low-energy lights and learnt to electroplate jewellery thanks to the Advanced Technology Project.

St Pat's technology students from across several subjects have expanded their creative design skills and developed technical knowledge through a series of projects aimed to give them hands-on experiences.

The students researched and designed their projects in the classroom before using their skills in the workshop and kitchen to create a model of the design. Some students used the college's 3D printers while others hand-worked their projects to completion. According to teacher, Bradley Sheridan they all enjoyed seeing a project through from design to a final product.

"The students valued getting the designs from the page or computer screen to a fully-functioning object," Bradley said. "They had to use all knowledge from STEM subjects to create the projects – we had some standout pieces."

The students had to work out the dimensions of their creations as well as the production costs and selling prices.

Students from Electrotechnology studied a project in low-energy lighting. They tested the best type of light based on energy efficiency, choosing from LED, halogen and incandescent. They calculated the energy efficiency through an environment meter and the power through finding voltage and power use. After they had chosen the most efficient

type of light bulb, students designed their light, some using CAD and then 3D printing, and others by making the product in woodwork or acrylic.

The metals and engineering students designed and constructed a piece of jewellery, using mild steel plated with nickel to create unique pieces.

St Pat's technology STEM credentials were also given a further boost last year with the announcement it would be included in the Australian Government's P-TECH program. The P-TECH program complements ATP but uses differing approaches.

"Where ATP has been a boost for curriculum, P-TECH provides direct links to local industry and further develops skills to take students into the workforce of the 21st Century," said Bradley. "Both programs have a strong STEM focus and together give St Pat's tech students a fantastic base to begin their careers."

St Pat's tech is working with 2 employers as part of P-TECH: Century Engineering and PMB Defence. Both companies have identified areas where skills can be improved or modernised. In the near future students will engineer a welding project and have their welding skills tested against the Australian Standard.

The students who work with PMB Defence will take part in a coding project for a battery, where they will design and make a probe to take voltage, charge, current and time elapsed readings for a lead-acid battery.

Bradley Sheridan
Manager, ATP
St Patrick's Technical College

Schools join ATP

In 2016 the Advanced Technology Project was asked by the Department of Defence to increase the number of schools within the program. With this in mind 12 new schools (6 government, 3 Catholic and 3 independent) that are considered strong in STEM were invited to apply to join the ATP program.

Six schools responded with applications, and 4 schools said they would be interested if the opportunity was available again in the future. Applications were reviewed through a panel process and 5 schools were offered a place in the project, based on their strong STEM focus and current investment for the STEM curriculum.

A warm welcome to our new ATP schools: Brighton Secondary School, Mitcham Girls High School and Woodville High School (government sector), Mt Carmel College (Catholic sector) and the Portside Christian College (independent sector). We are very excited to have them join the team and watch their new STEM programs develop. We also welcome back previous ATP teacher from Henley High School, Simon Brooks who is now a STEM Assistant Principal at Mitcham Girls High School.

Mount Carmel College launch engineering course for shipbuilding

Mount Carmel College, one of ATP's new schools, has designed a more advanced engineering course to allow its student an easier voyage into the shipbuilding industry.

The school already has a trade training centre and offers vocational training in engineering but following the recent announcement by the Australian Government that it will open a maritime technical college in Adelaide next year, the school has decided to create a higher-level course to prepare its students for future defence projects in the state.

The college has partnered with TAFE SA and will offer a Certificate II in Engineering for year 11 students from July this year. Acting Principal, John Konopka said that students who study a trade at school have an advantage in training to industry standards while earning credit towards their SACE.

STEMships – apprenticeships for students interested in STEM

It all started with a broken old rotary-dial telephone that sparked his childhood curiosity for Xavier Baker, now working for electronic design and manufacturing company, Entech Electronics while completing a Certificate III in Electronics and Communications.

"I pulled the old telephone apart, moved a few wires, plugged it in, dialled a number and voila, it was working again. I was soon building computers and in demand to fix any kind of broken technology at home," said Xavier.

Xavier was offered a job with Entech through a school-based apprenticeship (SBA), which allowed him to 'learn and earn' at the same time. But the former Henley High School student's career pathway may have been very different but for his discovery of the SBA system, where students like him gain entry in a trade, complete high school and earn money as well.

"Like many students, Xavier was planning to do 4 subjects, get an ATAR and go to university, but discovering SBAs was a more rewarding pathway," explained Chris Houltyb, DECD Apprenticeship Broker.

"Since starting the apprenticeship Xavier has studied with TAFE, gained real world experience and got qualifications such as the Institute for Printed Circuits (IPC) accreditation to IPC A 610 Class 3 standard." (IPC is an internationally recognised standard for manufacturing of electronics).



Jason Reeves, Xavier Baker and Chris Houltyb

"The incentive for employers is to get the right people and, crucially, getting schools to understand industry needs. It's also about building and nurturing long-term partnerships," said Chris.

For Jason Reeves, Entech's Director of Sales, STEMships are the perfect way to get young, up-and-coming future leaders and workers into the business.

The 'right person' for Jason is someone with above average maturity, who is focused and self-driven, just like Xavier. *"A lazy apprentice won't work out, particularly in this industry. We are also an equal opportunity employer and would be delighted to have female apprentices."*

"Our apprentices can have long-term careers here. We employ about 300 staff globally, and one of our apprentices has been here for over 20 years. He's now a project manager and spends about 8 weeks a year overseas. He is a perfect example of someone who we trained up young, who got his trade qualifications and his career has just gone from strength to strength," said Jason.

"I'm from a family of 8," said Xavier, *"and my mum and dad both went through apprenticeships and raised the whole family, so I know that apprenticeships can lead to good things. I've been given the opportunity to work in almost every area of the business, including directly with customers. I love working at Entech!"*

There are 17 apprenticeship brokers in South Australia. If you would like to find out how your company or school can get involved, contact Chris Houltyb, Apprenticeship Broker on mobile 0488 584 029 or via email at Chris.Houltyb@sa.gov.au

A taste of STEM for year 10s at Aberfoyle Park

Flinders University invited a group of 16 year 10 students to experience the delights and mysteries of STEM in February this year. The students, from Aberfoyle Park High School, attended the Taster Day to gain an insight into potential STEM career paths.

Jarrold Chave, Assistant Principal, STEM, said they experienced a range of science, engineering and mathematics workshops such as Zombie Maths, Cooling Gases, Analytical Chemistry, Animal Adaptations and Paleontology.

"In these workshops, students engaged in activities around evolution, animal adaptations, polarity, states of matter as well as examining skulls and bones to obtain experiences in the field of paleontology," Jarrold said. *"Throughout the day, they were fortunate enough to hear presentations from the Executive Dean, Professor Martin Westwell and Dr. Sherry Randhawa who shared her expertise in the ever-expanding field of robotics."*

The day was enjoyed by all and students who attended were further enlightened about the many opportunities that STEM can provide in their careers.



Students at the STEM Taster day

Mitcham Girls takes on tech challenge

In 2017, Mitcham Girls High School will be entering its inaugural First Tech Challenge team, which will comprise students ranging from year 8 to year 12. Students will work together throughout the year to build and program a robot to compete in the national competition in December.

Seventeen Mitcham Girls High students took part in an excursion in March to Trinity College, where they worked with the championship-winning team from 2016. During the day the girls learnt a lot, including the finer details of the competition such as how to code in JavaScript and to program and steer the robot.

Throughout this year the team will be holding various fundraisers to help support their journey to the national competition, held in Sydney.



Hamilton science students shine

A wealth of new and exciting curricula and extra-curricular experiences were on offer to Hamilton Secondary College science students during 2016, including visits to Flinders University for science enrichment programs, excursions to Adelaide University and the RAAF Base. The year 10 class also took part in the Science & Engineering Challenge, held at Flinders@Tonsley.

The school's involvement with STEM activities in the Advanced Technology Project resulted in students from years 8 to 11 exhibiting their projects and being judged on their work at the August 2016 STEM Expo at Tonsley TAFE. The audience was 400 local primary school students and then in November, hundreds of secondary students at the Concept2Creation Expo.

"This year 2 boys and 2 girls from year 10 were awarded scholarships to attend lectures and workshops in the STEM SISTA and STEM MISTA project," said Science teacher, Mike Roach.

"Students in year 9 took on another new Concept2Creation project this year and designed, built and tested a wetland environmental management craft, which could take samples of water from 4 different locations in a wetland environment," he said.



Mike Roach (pictured) was recognised for his tireless efforts over the years of promoting Concept2Creation. He was presented with the 2016 Outstanding C2C teacher award.

Year 11 physics students were once again involved in Concept2Creation projects. They learnt to fly drones in a competition to find faulty transformer insulators with SA Power Networks, and to design and build a robotic drilling machine to explore the geology of a Martian surface.

Tony Virgo
Manager, ATP
Hamilton Secondary College

Year 8 medieval tournament showcases trebuchets

As part of Le Fevre High School's medieval day celebrations for year 8s, all science students constructed a trebuchet, a catapult-like machine used in medieval times to overcome castle defences.

Manager, ATP at Le Fevre, Thierry Herman said that a laser cutter was used to make cardboard trebuchet templates for each class, and also used for the castles under 'attack' during the medieval day tournament.

"Students worked in small groups to build a trebuchet and tested it using differing sling lengths. They took measurements of the distance their projectile travelled, increasing sling lengths and graphing the results," he said. "This data was useful during the tournament as each group made calculated predictions about which sling length would be required to hit the castle 4 metres away."

On a Friday afternoon in March, the Le Fevre quadrangle was abuzz as each year 8 class trialled their trebuchets to find their best team to compete in the final. Some groups overshot the castle, some fell short but the finalists all hit the target.

The winners had the privilege to fire the 'big trebuchet' that was created with the help of year 12 students. It had a 1.2 metre beam length and an 8 kg steel counterweight, which gave the trebuchet a range of between 25 and 30 meters with a 148 g lacrosse ball projectile.

"By doing this activity, students had a lot of fun and also gained a good feel for STEM concepts such as design, force, acceleration, momentum, the mathematics of graphs and optimisation," said Thierry.

Thierry Herman
Manager, ATP
Le Fevre High School



Professional development

In 2016 the ATP program sponsored a number of our schools to participate in 3 days of professional development which covered students working with industry through a problem based learning process.

The professional development was run by the Australian Science and Maths School (ASMS) and DECD Business Partnership Manager, Sam Pearse who compiled a series of short videos capturing the teaching and learning.

<https://vimeo.com/channels/pblwithindustry>

Videos of ATP Schools who have participated in PBL with industry include:

- **Blackwood High School and Haighs –**
Focusing on engineering processes with the design and production of new products
<https://vimeo.com/206173712>

Two projects funded by Dept of State Development under the 'Students in Manufacturing' project were:

- **Unley High School and Dematec –**
Energy efficiency
<https://vimeo.com/196512330>
- **Henley High School students and Dematec –**
Designing energy efficient housing
<https://vimeo.com/196510910>