The Maritime High School based at Le Fevre High School is an initiative of the South Australian government and combines secondary school studies that have a specific focus on high level maths and science and technical Vocational Education and Training (VET) within a maritime context.

The Maritime High School now combines secondary school studies that have a specific focus on maritime studies for the Western Adelaide regional schools. In addition to the maritime vocational courses, a number of maritime scientific studies courses have been developed providing opportunities for students to study ship design, electronics, radar, GPS and navigation technologies. This provides a training pathway towards achieving a nationally recognised vocational accreditation and the South Australian Certificate of Education (SACE) at the same time.

Le Fevre Teacher spends time at Levett Engineering

In June 2015, Chris Chrisakis, a VET engineering teacher from Le Fevre High School, had the opportunity to spend four days at Levett Engineering.

Levett, based at Elizabeth, uses machining technology manufacturing and specialises in high security components for the aviation, defence and maritime industries.

During the placement Chris operated various three and five-axis CNC machines. The materials involved were titanium and high-tensile aluminium. Chris checked all the components specifications to the drawings supplied by the customer.

“I found it very interesting that Levett wants young people who have basic skills and experience in manual machining processes. For example, basic measuring skills, use of engine lathes, drilling and milling machines,” said Chris.

Chris also spent time in metrology where he observed Levett’s high precision measuring using CNC measuring machines. He became familiar with their quality control and quality assurance processes and appreciated the preventative maintenance program for their equipment and machinery.

He used this opportunity to talk with both tradespeople and management to see what they believed were the most valuable skills and knowledge for students doing work placement and apprentice selection.

“This is why I find the VET engineering trades program so valuable for students at Le Fevre because it gives them the opportunity to showcase their skills in the workplace during the Structured Workplace Learning program,” Chris said.

“The added knowledge about the new capabilities of CNC machines has been invaluable for my teaching and something that I will take back to the classroom.

“I would like to take this opportunity to thank Levett Engineering for providing this great opportunity and allowing me to be part of the team in their machine shop.”

Where are they now?

Mikayla Thompson is currently a first year student at the University of Tasmania, Newnham Campus, more commonly known as The Australian Maritime College (AMC).

Mikayla completed Year 12 at Le Fevre High School (LFHS) in 2014 and is now studying a Bachelor of General Studies (Engineering Pathway) bridging into Bachelor of Engineering – Naval Architecture (Honours).

“I transferred to LFHS in Year 12 because of the unique partnership that the school has with AMC, which gave me opportunities to visit the college for a three-day study trip. I also had constant contact with AMC, which helped me to complete the LFHS Maritime Science subject. That gave me solid background knowledge and has been very beneficial this year,” said Mikayla.

“First year at uni has been interesting so far – I have completed both units from UTAS and AMC and I’ve had to complete a course in basic mathematics and basic science. I have also had the pleasure of doing Engineering Design and Communication. For that subject, in 13 weeks, in groups of six, we created an autonomous surface vehicle (ASV) 0.5m long, 0.25m wide and 0.25m high. It had to be fully waterproof, buoyant and fully autonomous, which means robot controlled. The machines had to detect a course and make all decisions without human help.”

I also studied a unit on engineering-based mathematics, a physics unit and another unit called Experiencing Engineering, where I learned about statics in “a fun hands-on way”. In the Materials Technology unit, the class looked at different types of materials and then tested their knowledge by making a longboard surfboard which I will test at the end of the semester.

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Where are they now? story continued...

“Campus life has been even more enjoyable then I first anticipated – there is always something happening and many new people in the same situation as me, who have just moved states and are straight out of high school,” said Mikayla.

“The campus activities range from sitting together outside on a nice day, playing pool or table tennis, or having a shared dinner. There’s a sports competition set up for residents only, which is always a laugh – we play or watch anything from bubble soccer, volleyball or netball.

“The other great thing about living in Tasmania is that I’ve got to enjoy the lovely snow throughout the state.”

Written by Mikayla Thompson

Sailing the ‘One and All’ to Wallaroo

It was an early start for half of the maritime industry pathway VET students on Saturday 12 September. They met at 7.30 in the morning at McLaren Wharf in Port Adelaide for the start of their journey sailing on the ‘One and All’ to Wallaroo in South Australia’s mid-north.

“We spent the first day on board the ship learning ‘the ropes’ and running through a full training including ascending the masts and staysails, flood and fire checks and taking the helm,” said Liam Narcys from Le Fevre High School.

It wasn’t until 6.00pm that the Tom ‘Diver’ Derrick Bridge opened to allow the tall ship out of the harbour.

“We made our way north out the break water, and then south to exit the Gulf of Saint Vincent. Throughout the first night all trainees and crew members took four-hour shifts. We were each part of three watch groups: starboard, port and middle. That night was fairly smooth sailing, with calm seas and an excited crew. On Sunday morning at breakfast there were a few weary eyes as crews struggled with being up most of the night. All members on the voyage were awake for breakfast in the morning and ‘happy hour’ which has teams assigned an area of the ship to clean. Cleaning ranges from scrubbing the decks to cleaning the galley and heads (toilets),” said Liam.

The students took part in activities on Sunday, including setting the sails, which needed a group effort to haul the heavy sails. Ascending the masts and staysails was a highlight for several people, and gave them the opportunity to climb the 27-metre-high mast and then walk a further five metres outward on the staysails!

By Sunday night there was a change in sailing conditions as the ship left the shelter provided by Kangaroo Island and Yorke Peninsula. A few crew members succumbed to sea sickness and the night watchers were busy ensuring the ship kept a smooth sail. By the next morning the seas had calmed and, after the daily chores, the crew members who were not on watch had some time to relax and enjoy the numerous dolphins swimming alongside.

“On Monday we needed to prepare the boat for the next school to board at Wallaroo. Our students took down all the sails ready for the boat to dock. After one last dinner, the final goodbyes were said and we all started the two-hour bus journey back to Adelaide.”

Overall the students and staff enjoyed the fantastic opportunity on the ‘One and All’ and now we look forward to the other half of the class undertaking the same journey in November.

Studying the physics of sail boats

The physics of sail boats has been examined by Le Fevre High School’s Year 11 students this year, which took in the study of hydrostatic, hydrodynamic and aerodynamic principles such as Archimedes principle, righting moments and torques, fluid mechanics, physics of sails and electronics control systems.

The class of 21 students – 16 boys and 5 girls – manufactured a one-metre sailing boat by tailor-making all the necessary parts and hull, using a blend of traditional methods and advanced technologies such as laser cutting and engraving.

“The hull is made of a wood called paulownia, easy to cut on the laser cutter and easy to sand afterwards,” said teacher Thierry Herman.

“Students glued about eight layers of this wood to create a 3D shape looking very much like contour maps. They then used various sanding techniques to shape the outside to create a hydrodynamic hull.

Studying the physics of sail boats

Continued next page
The trip was supported by AMC and Le Fevre (Maritime) High School to give participants an insight into the maritime study pathways provided by the AMC.

### Student study trip to Australian Maritime College

Late in June 2015, 14 Year 11 and 12 students from several Advanced Technology Project schools were once again part of the annual excursion to the world-class facility at Australian Maritime College (AMC) in Launceston Tasmania.

“Our journey started at 5.00am on a Wednesday, when we all met at Adelaide airport to fly to Melbourne, and then on to Tasmania,” said student, Phoebe-Mae Chappell.

In Tasmania the students boarded a bus to the AMC, where they were warmly welcomed by university students and lecturers.

“Straight away we had a tour of the campus – we were shown things like the sailing simulator, the test tank, the tow tank and the cavitation tank. These opportunities helped open our minds to potential careers and university courses that can be done through AMC, like aquaculture, naval architecture, or marine biology,” said Phoebe-Mae.

The next day, the visiting students performed practical exercises with great enthusiasm. “We were in a heated pool area for a survival exercise, where most of the natural and artificial light was blocked out and we had to jump off of a three-metre high block. This showed us what it would be like to jump off a ship’s deck and swim to an inflatable life raft and we did all this while sprinklers on the roof simulated rain.

As part of the trip the group also travelled to the Beauty Point Campus, where they inspected AMC’s flagship the Bluefin, and the college’s floating classroom – a 60-year-old converted coal ship. “We saw examples of fully enclosed life boats that can protect up to 20 people from the harshest weather conditions,” said Phoebe-Mae.

In spectacular weather, the students boarded an open lifeboat for a short voyage back to the main facilities.

“All in all,” said Phoebe-Mae, this was a great experience and I learnt a lot from it.”

The trip was supported by AMC and Le Fevre (Maritime) High School to satisfy the SACE requirements for their Naval Engineering Integrated Learning course.

“They had a great time and it was a real pleasure as a teacher to see them bloom and grow confident to such an extent that in the end, I was more guiding than actually teaching. As one of my students put it, ‘Not only have we built an efficient sail boat, we also know now – and can explain – how and why the different parts work together to make this boat seaworthy.’”

**Students in the pool participating in a survival exercise at AMC.**

Written by Phoebe-Mae, student at Fremont Elizabeth City High School.
SUBS in schools

Le Fevre High School students have been studying submarine technologies during semester 2, as part of the SUBS in Schools program, developed last year by REA (Re-Engineering Australia), the Department of Defence and a number of industry stakeholders.

The engaging program looks into the technology of submersible vehicles and submarines and is built on the fundamentals of project-based learning. It covers topics such as hydrostatic, hydrodynamic and electronics principles as they are applied to submarines, righting moments and torques, fluid mechanics, cavitation, propulsion systems, the physics of diving planes and rudders, and electronics control systems.

Le Fevre students built a prototype of a submarine for the ‘SUBS in School’ competition, which was a real challenge.

“Students made all of the necessary parts and hull, using a blend of traditional methods and advanced technologies such as laser cutting and 3D printing technologies. They also completely re-designed the original layout for the electronic control system to streamline and simplify the operation of the submarine, making it in the end very efficient and more reliable,” said Liam Narcys, Maritime Leader at Le Fevre High School.

“Day one of the state final began on 8 September with ASC hosting a tour of their submarine facility for the 50 students and eight teachers from the six competing high schools,” he said.

“There were students from Noosa District High School in Queensland who had travelled down to compete against our schools. The students took part in pool activities, hosted at the Prince Alfred College aquatic centre, where they conducted trials. Teams were asked to present their boats and perform set tasks. To many, this was seen as the most important part of the submarine project — asking the question does the boat perform as a submarine should?”

The set tasks measured readiness to set sail, teamwork and cooperation, experiment and improvement, and performance. The Le Fevre Submariners won first place in the sea trials.

“The achievements of our students highlighted the fact that if you have a passionate teacher such as Thierry Herman who’s able to inspire students, great results can be achieved,” Liam said.

Students were back on dry land for day two of the competition, hosted at the Royal Adelaide Show. This included judging of the student’s engineering component, portfolio and the verbal presentation.

“In all of these presentations, the students were clearly able to articulate their knowledge and understanding of the concepts learnt through building their submarine,” said Liam. “Our team came third in this section and were third overall. They were excellent ambassadors for the school and we are very proud of them.”

Students with the submarine they built.

Le Fevre High School display at the Royal Adelaide Show 2015.