

STEM WEEK

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If you check the inbox of any maths or science coordinator's email account over the past year you'll find it flooded with many STEM-related items. STEM is everywhere and it can be overwhelming sifting through the volume of material and making sense of what is relevant and meaningful and what is not. By now we all know what STEM stands for - but what does it really mean for schools?

WHY STEM?

The results are in. It's estimated that 60% of the 2020 workforce will require skills held by only 20% of the current workforce.

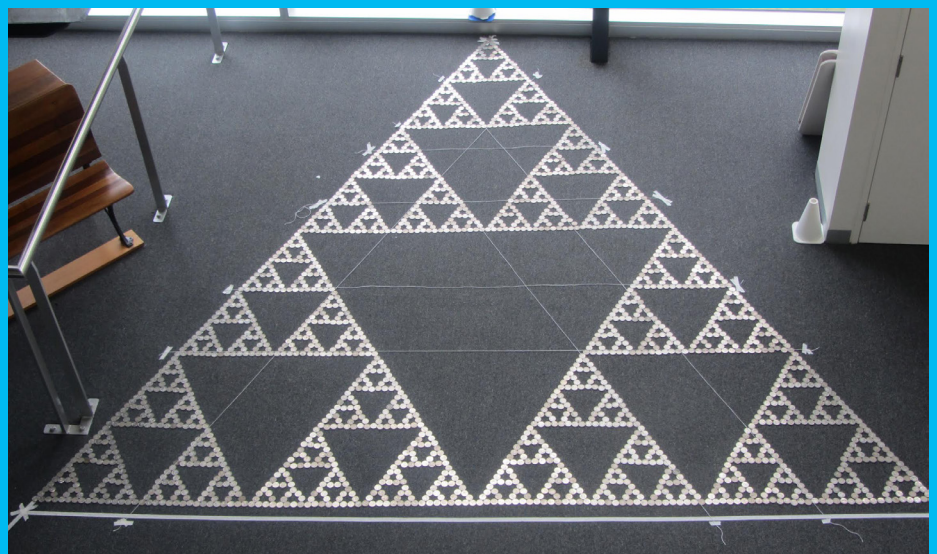
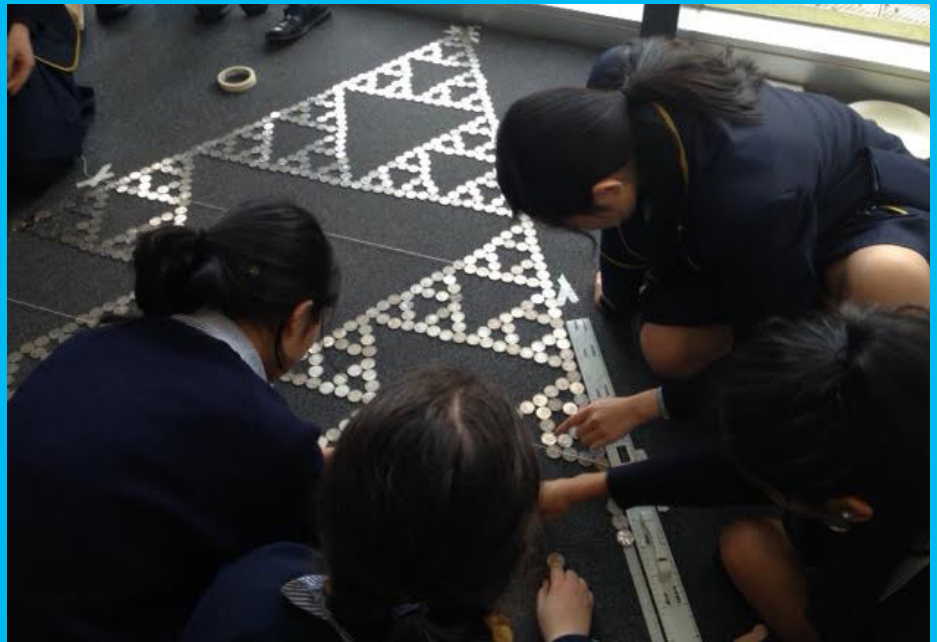
There's no doubt we agree that science and maths play an ever increasing part in our lives. We make important decisions about our health and that of our family, for example, choosing to vaccinate our children. We use smart phones to communicate and GPS in our cars to get from place to place. We regularly hear or read about climate change, genetically-modified food, space exploration, the use of DNA in forensic science, and new drugs to treat disease. And yet there is a general view that the level of scientific literacy and numeracy in the community is low.

An understanding of science and maths and how they work is essential for the community to make informed choices on issues that have a scientific basis.

Education in STEM is the key to broadening and deepening the community's grasp of what STEM is saying and doing about the complex challenges facing society.

For schools, along with content, we need curricula that encourage curiosity, reflection, critical thinking and develop scientific method. STEM is about promoting an awareness of science and maths related careers and career opportunities and ensuring the development of relevant skills necessary to participate in STEM careers of the future.

Motivated and excited by the current focus on STEM we decided to organise a STEM week at Fintona. Months of planning and preparation came together under the framework of a joint initiative from the science and mathematics faculties.



The week saw students across many year levels given the opportunity to participate in a wide range of engaging and thought-provoking activities.

Robogals, a group of Monash female robotics engineers, started the week with a workshop for the Year 7 students. Who would have thought a robot could dance to One Direction?

The Years 5/6 students were treated to a Fintona Maths trail produced by the Year 9 students using iPads and QR codes. A lovely cross-age activity and it was great to hear the level of mathematics being discussed. Tuesday arrived and the Year 8's ventured into the city to look at the mathematics

of the architecture of Swanston Street on the Mathematical Association of Victoria's maths trail (<http://madebymaths.mavvic.edu.au>).

A super day was topped off with a visit to explore outer-space in spectacular 3D at the Centre for Astrophysics at Swinburne University. *Paper Planes*, the movie, kept the younger students entertained during lunchtimes and gave them plenty of ideas and inspiration for Fintona's paper plane Contest. The Engineering Link Group, (TELG), brought in working engineers from industry and the armed forces to work with the Years 9/10 girls on Thursday in a variety of workshops aimed at highlighting the diversity of careers in engineering.

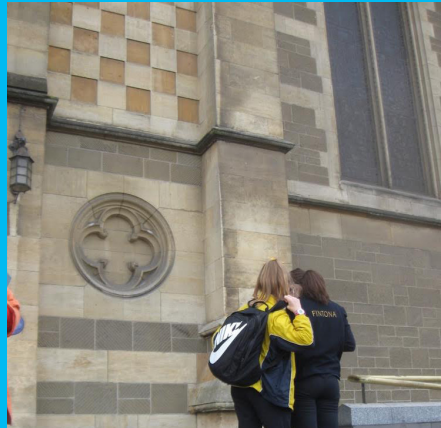


Parachutes were designed and tested to cushion the flight of an egg from a second floor balcony (many survived - see above!) and exacting calculations were pondered in producing the right gear ratio to ensure the mechanical car completed the time trial with precision. On Friday, the senior levels came together to hear from four guest speakers in the STEM mini conference.

Fintona was host to four leading Australian scientists and mathematicians, Drs Graham Mitchell, Jee Hyun Kim and Norman Do together with Associate Prof James McCaw. They each presented on their fascinating areas of science and mathematics and stimulated interest and enthusiasm in their varied and unique fields.

Dr Graham Mitchell, a veterinary science graduate and gold medallist at the University of Sydney, spoke of the importance of science in an ever-changing world. His discoveries, while at The Walter and Eliza Hall Institute, were fundamental in the global development of tools to control parasitic diseases. As well as holding many roles including Director of the Royal Melbourne Zoological gardens, he is an advisor to the government on innovation and technology.

Dr Jee Hyun Kim has been involved in researching the how our responses during infancy and childhood are critical in subsequent drug use and the development of anxiety disorders. She is also the chair of the Australian -New Zealand Bee challenge which aims to foster the development of an interest in science careers amongst school leavers. She shared her personal perspective of her journey through science and gave some intriguing highlights of her work at the Florey Institute.



Associate Professor James McCaw uses mathematics and science to build models that simulate the transmission of diseases such as influenza. His work through the Department of Mathematics and Statistics and the Centre for Epidemiology and Biostatistics at the University of Melbourne enables the development of new strategies for controlling the spread of transmissible diseases. James' work on the mathematical modelling of infectious diseases is of great importance to many other public health practitioners.

Dr Norman Do researches mathematical patterns and their application to diverse mathematical problems and theoretical models of the universe. Hence his research leads to a deeper understanding of the laws of nature. His hope is that his research will facilitate future scientific advances. Dr Do is also involved in many community outreach programs, including an involvement with the Australian Mathematics Trust and writing for the Australian Mathematics competitions. Jointly he initiated the Monash maths academy for motivated students.

The audience was privileged to be part of a very special morning of presentations. Staff and students of Fintona, teachers and students from a number of other schools and invited parents were enchanted and enthused by the courage and wisdom of the fine young scientists. The presentations served to break down many of the stereotypes of what scientists and mathematicians do.

The speakers each focussed on actual examples, exposing what working in fields of the science and maths mean and how they are relevant to society.

STEM week also allowed the chance to reflect on the wonderful opportunities provided by a science/maths education at Fintona and presented a unique opportunity to give back to the community. Fintona girls were generous in their donation of twenty cent coins. We raised over 2187 coins, enough to produce a dazzling piece of maths art in the form of a Sierpinski triangle. The money raised will go to the organisation Big Brother-Big Sister, a group that sets up mentoring programs for disadvantaged and at risk students.

STEM week at Fintona delivered all that it promised. Many students were challenged and inspired and, most importantly, finished the week wanting more. Teaching maths and science is much more than the cramming in a busy curriculum, worrying about NAPLAN/VCE results and debating the tensions between skills-driven courses versus open-ended investigative learning. It's about ensuring we fuel and promote the right passion in our teachers; that our teachers are knowledgeable and energised to educate and invigorate the STEM learners of tomorrow.

Fintona Girls' School is an MAV accredited Mathematics Active School.

The MAV will be releasing an updated *Made By Maths* version of our app in time for the conference in December.

This will include fine tuning what we have already created and updating programming to cater for the latest iOS and Android software.

In addition, the MAV will also release two new walks for the app at the conference. One walk, aimed at junior secondary, will be a guided mathematical walk around La Trobe University - Bundoora Campus. The second walk is aimed at upper primary school. This walk can be completed on any school grounds.

If you are planning on attending the MAV conference, it may be a great chance to trial the La Trobe walk!

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