




Start Your

Story: Georgie Oakeshott

A unique competition is addressing the engineering skills shortage and boosting our future as a nation of innovators.



It's the stuff young dreams are made of: the opportunity to be part of the global phenomenon that is Formula 1 motor racing. Imagine if that opportunity was something you could do at school. Imagine no more.

The dream has come true for thousands of year 7 to 12 students across Australia, and millions around the world, who are taking part in the 'F1 in Schools' competition.

The aim is to design and construct the fastest, most innovative model Formula 1 car of the future. The students have access to professional-standard 3D engineering design and analysis software, smoke tunnels, wind tunnels and multi-axis manufacturing centres.

Powered by small CO₂ cartridges, the cars built by these 12 to 17 year olds are capable of reaching speeds of 80 km/hr, and getting faster all the time.

At Australia's recent national finals, three teams broke the highly-prized one second barrier over a distance of 20 metres. That's pretty fast for a block of balsa wood.

Judges at the finals described the standards as "mind-bogglingly high", with students also achieving unprecedented perfect scores in verbal presentations and innovation.

Engineering professionals, teachers and parents have been left gob-smacked by the results, with employers even declaring some students immediately employable.

Now in its sixth year in Australia, the competition has also attracted the attention of federal parliament.

An awards night in parliament's Great Hall was well-attended by members of the House of Representatives and senators, who welcomed the opportunity to meet these innovators of the future and test their skills on the race track.

Sharryn Jackson (Member for Hasluck, WA) told the House of Representatives it is "a wonderful and stimulating opportunity to be involved in a program that successfully connects education with industry".

"It exposes students to the exciting career opportunities that are available in science and engineering," she said.

Philip Ruddock (Member for Berowra, NSW) agreed, praising the students for taking up the engineering challenge.

The competition is delivering on a number of fronts. It's providing strong educational outcomes, enhancing career prospects and reigniting interest in technology-related subjects





re-Engines

previously being overlooked by students more interested in business or law than engineering.

Many schools have reported that enrolment demand has increased by 300 to 400 per cent for design and technology related subjects.

Organiser and engineer, Michael Myers of the Re-Engineering Australia Forum (REA), says he's been blown away by the quality of work the kids are generating.

"It's very high and it keeps getting higher," he says. "When you see the work these kids are turning out, it's absolutely world class."

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"I doubt there are five engineers in the country using computational fluid dynamics, and we've got thousands of kids doing it."

A not-for-profit organisation established to raise awareness of engineering as a career, REA offers the F1 in Schools competition as part of its 'Schools Innovation Design Challenge.'

There is an estimated 30,000 students taking part in the competition from more than 200 high schools across the nation.

Another 50 schools will be testing their engineering skills in the next competition, with more schools already lining up for 2010 and beyond.

Supporters of REA include the Defence Materiel Organisation, the Royal Australian Navy, the NSW government and industry groups such as Concentric, Webex, ResMed and Dassault Systemes, which has contributed \$450 million of specialised software to Australian schools.

REA believes its rapidly expanding program is providing a valuable solution to the skills crisis facing engineering and manufacturing.

The philosophy is simple: provide students, teachers and schools with the best technology and we'll end up with the best students.

According to Mr Myers, the schools getting the best results are the ones giving all the decision-making responsibilities to the students.

"In a sense we're just opening the door and letting the kids go. The results are absolutely staggering," he says.

While the F1 in Schools competition revolves around a model racing car, the aim is to inspire students to learn about engineering and science principles such as physics and aerodynamics, design and manufacture and apply them in a practical, imaginative, competitive and exciting way.

They also learn about leadership, teamwork, media management and financial strategy, but because they're so focused on getting the fastest times, they often don't realise all the skills they're developing.

"It's all about the racing, that's what they're excited about, but it's only 10 per cent of what they do," Mr Myers says.



DREAM RIDE:
Thousands in Australia take part in the F1 in Schools competition. Photos: jupiterimages

Because it's fun, these students aren't fazed by the enormous amount of work involved and are happily spending time after school, on weekends and in school holidays working on their cars.

Their teachers are usually just as enthusiastic, and possibly the only complaint about the competition is from their partners who are seeing less of them because of the hours they are devoting to the program.

Graeme Hutton has an engineering background and is now a teacher at Canberra's Trinity Christian School, the school behind the new national champions Redline Racing. He's a big fan of the competition and what it's achieving.

"From the moment I heard about F1 in Schools I was very excited about the possibilities for learning and having fun at the same time," Mr Hutton says.

"These students are going through an engineering process where they analyse and make judgments about which way to go with their car. These are really important problem solving and innovation skills.

"They're also learning that if you work hard and are prepared to put in the time and effort, then you can get some really good rewards. I think they'll all develop a great career from that."

Trinity Christian School Principal, Carl Palmer says the competition combines valuable learning with fun and appeals to both boys and girls. The school's winning team is made up of four boys and a girl.

"The engineering is at the cutting edge. Even the engineers involved said if only they'd known as much as these young people in their time, what a difference it would have made.

"It provides an important learning experience, that if you give something your best, you can achieve success."

As part of its vision to stimulate the nation and inspire young Australians to take on the world, REA offers more than the excitement of Formula 1 racing.

Children as young as kindergarten age, around four or five years old, are also being introduced to engineering and innovation programs.

Using 3D modelling software, these children are designing their own toys. Once designed on the computer screen, the toys are prototyped and sent back to the children to experience the outcome of their imagination.

One school used this modelling activity in a science class, where students examining insects under microscopes were given the software to design their own bugs.

This is a process which demystifies technology, according to Warren King from the Defence Materiel Organisation (DMO) which recently announced a three-year sponsorship of REA worth \$480,000.

"It flips technology on its head and shows how it can work for you," he says, "and young people who have done that will never have a worry about technology. They'll always be looking for the next challenge."

Mr King oversees many of the defence force's biggest engineering projects including the new Air Warfare Destroyers, one of the largest and most complex defence projects ever undertaken in Australia.



AUSTRALIAN CHAMPIONS:
Redline Racing team members (left to right) Alistair Smith, Daniel Boucher, Chris Law and James Mazengarb with their winning design. Photo: Andrew Dawson. Inset: jupiterimages

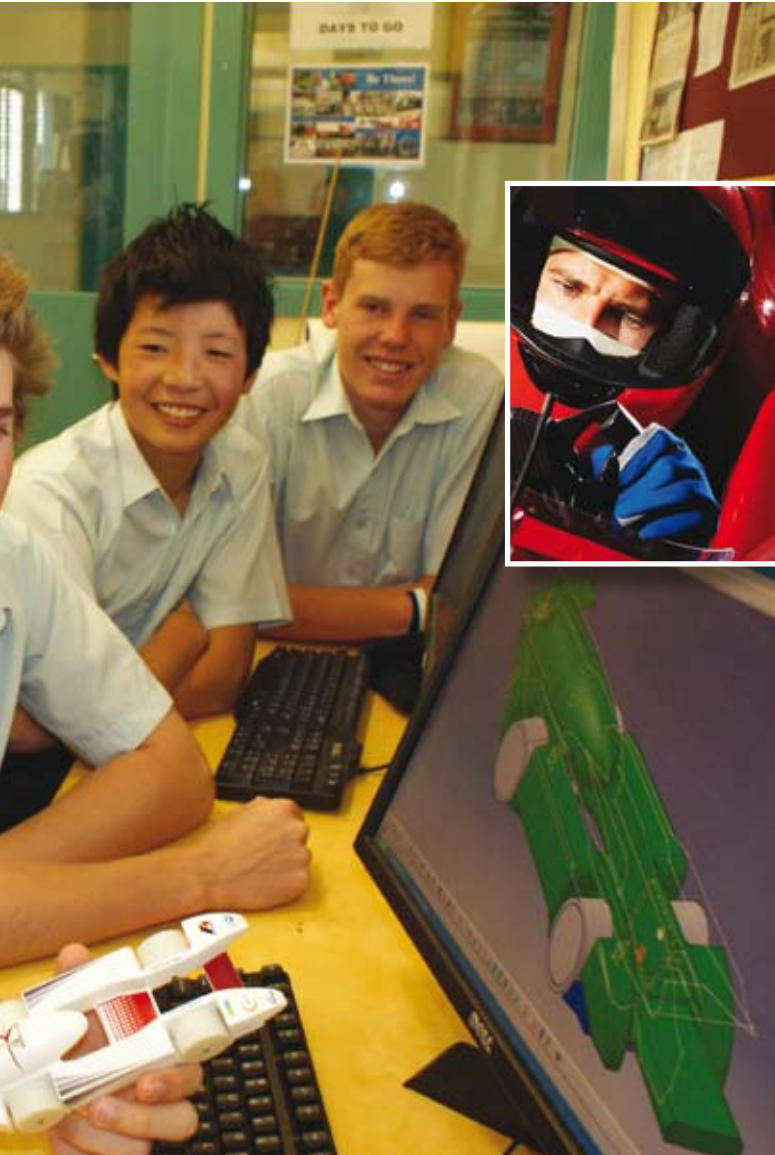
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An enthusiastic supporter of the aims and ambitions of REA, he hopes there'll be a positive spin-off for Defence as high school students start considering their careers.

"All the things they're doing now they could apply on a larger scale if they choose to come to the DMO in the future. We're a neat match for a lot of these students," he says.

"Our work is very much like the program management they're involved with and we're very interested in making some of these students think about us as a career."

He says in the past the DMO had a poor reputation for project management, but since its success rate had gone



Home straight

Year 9 students Alistair Smith and Daniel Boucher are going overseas... again.

As members of Trinity Christian School's Team Goshawk, they went to Malaysia for the 2008 world finals of the F1 in Schools competition, where they came second.

This year, as two of the five members of the school's Redline Racing team, they're off to the world championships in London.

"There's a lot on the line, we've put in so many hours. I've put in most of my holidays," says Redline Racing's project manager and design engineer, fourteen-year-old Alistair Smith.

In London, teams from 20 countries will be competing for the top spot as well as United Kingdom engineering scholarships worth more than \$1.5 million.

"It's a really good prize and it gives you an incentive," says Redline Racing's design and testing engineer, Chris Law.

"It's like, now you've won the competition and seeing you know so much, we're going to give you an opportunity, like another step into a future career in engineering."

Australia has an excellent track record at the championships, having won the most innovative design award every year since 2004. The Stingers from Melbourne won the world title in 2006.

"Before the competition I didn't know much about engineering, but through this program I've really developed an interest," says Chris Law.

An important element of the program is industry collaboration, which saw team member Annie Harper working with professional graphic designers to develop the team's logo.

"We are using all the tools that most other people wouldn't get the chance to use until they graduate from university," says Alistair Smith.

"To be able to get in there at our age and use the same tools and have that knowledge is just great. Before the competition I was considering a career in business or law, but after this opportunity I'm definitely considering mechanical engineering," he says.

Daniel Boucher has also had a rethink about his future. He was considering being a builder, like his dad, "but now I'd definitely like to be a manufacturing engineer when I'm older, just making components would be fun".

Team mate James Mazengarb has also set his sights on an engineering future. "Before this competition I thought I wanted to have a future career in engineering, but I wasn't quite sure," he says. "This really has locked it in for me and it has given me a really big head start."

For Alistair Smith, the dream is a career on the F1 circuit. "Driving would be fun but it's not secure. There's no guarantee of success," he says.

"Formula 1 relies on the engineers who make the cars so, as a secure plan, engineering is better."

up "quite dramatically" he'd been invited to Washington to work on defence procurement reform.

"You might have thought being seconded to the Pentagon was the highlight of my year, but it wasn't," he says. "The highlight of my year was going around talking to these young people. I'm often overwhelmed by their ability, and always re-charged by their enthusiasm."

Opportunities like this, where students meet and talk to people like Warren King, show them the relevance of their classroom activities, according to Michael Myers, who is also currently working on a doctorate in child psychology.

He says the ages of 15 and 16 are two of the most important years for teenagers making big life decisions. Students need to be introduced to a whole variety of role models and mentors to help plant the seeds of inspiration.

"I want kids to meet as many famous and important people as possible," says Mr Myers. "To see them and meet them and realise how normal they are, so they come away thinking, wow, I can do that." •

For more information on the F1 in Schools competition, visit www.rea.org.au