2013

bioLAB

VICTORIAN BIOSCIENCE EDUCATION CENTRE

SCIENCE & MATHEMATICS WITH A WINNING EDGE

Proudly Supported By:
Victoria’s network of Science and Mathematics Specialist Centres aims to improve student engagement and achievement in science and mathematics by providing innovative learning programs that encompass new and emerging scientific thinking, state of the art facilities and cutting edge technologies.

The centres provide specialised programs that are accessible to all Victorian students and professional learning programs for all Victorian teachers. They have an equity focus on rural and disadvantaged metropolitan schools.

Each centre is hosted by a government secondary school. The Centres each have an area of specialisation, while operating collectively as a statewide network.

The development of partnerships with local organisations, industry and universities is a focus for the centres.

The Specialist Science and Mathematics Centres Network proudly operates under the following Governance Principles:

- Excellence
- Integrity
- Transparency
- Equity
- Accountability

We are one of six science and mathematics specialist centres in Victoria.
I always enjoy this time of year, a time to reflect on what has been achieved and set goals for the year ahead. Throughout the compilation of this report I have a giant smile as I reflect on the many amazing achievements and wonderful work that has been done this year by the entire team.

This year has seen BioLAB continue to improve and refine our current programs alongside the exciting development of new programs such as Fast and the Curious and Sprinters Gene.

Our in-house programs continue to attract a growing number of schools to our centre with over 6000 students and teachers experiencing our inhouse programs this year. We have seen schools coming from as far as Horsham, Camperdown and even Moama! Many schools that are new to our centre travel from throughout Victoria and also many from the local region.

We have built on our strong lead partnership with Deakin University and welcomed new industry partners such as Geelong Cats and Ripcurl. It is with these new partnerships that we have developed the fantastic new programs, BioCATS and Materials Technology which are based on industry research and experience.

I'd like to take this opportunity to thank our partners and all of the supporters of BioLAB. Your support and enthusiasm for what we aim to achieve is integral to the success of BioLAB. It is so wonderful to be part of the education, scientific and local communities.

I would also like to thank the entire staff team, this report is a testament to the hard work and dedication you have shown throughout the year.

Well done!

I hope you enjoy reading about our year, and I look forward to seeing you all in 2014.

Yvonne Van Der Ploeg
We stand for educational programs of quality, relevance and excellence.

Our vision is to engage and inspire the next generation in science and mathematics careers using innovative technologies and techniques. We aim to increase awareness of scientific and mathematical career pathways and encourage lifelong learning by providing relevant, high quality educational programs to Victorian students and teachers.

Our programs highlight the wonder of science and mathematics using the theme of Human Performance and Sport.

We strive to find new and unique ways to best engage and interact with a broad cross section of students and teachers in Victoria.

We have seen many improvements and achievements in 2013.

BioLAB provides specialised programs that are accessible to all Victorian students and professional learning programs for all Victorian teachers. We have an equity focus on rural and disadvantaged metropolitan schools and take these groups into consideration when designing program content.

Throughout 2013 learning intentions have been incorporated into all programs to ensure a consistent message encompassing curriculum objectives and BioLAB priorities is delivered to all recipients of our programs. These learning intentions make the key ideas of each program clear to our staff, visiting teacher and students.

This approach has led to the delivery of effective programs with a considered and deliberate emphasis of key ideas that promote a greater degree of student engagement in science and mathematics.

Success criteria have allowed the application of knowledge which students have obtained during programs to be assessed.

Strategically incorporating literacies of science into these criteria has helped to raise the profile and relevance of real science that occurs in the world around these students every day.

- Majority of teachers surveyed (98.6%) rated their students’ engagement during the visit to be Excellent/Very Good.
- Majority of teachers surveyed (98.6%) rated their experience at BioLAB as Excellent (85.8%) to Very Good (12.8%)

Target Student Group 2013 Participation

- Rural Students
- Metro Disadvantage Students
- Standard Rate Students

Term 1, 2013
- 30%
- 27%
- 20%

Term 2, 2013
- 40%
- 28%
- 28%

Term 3, 2013
- 35%
- 28%
- 33%

Term 4, 2013
- 50%
- 52%
- 38%
We strive to re-ignite an interest in maths and science by allowing students to experience new and relevant applications and career pathways.

BioLAB provides programs across a variety of curriculum focus areas. We do this in an aim to capture those students who may be disengaged with science and mathematics and also to reinforce the benefits of science and mathematics in everyday life.

Our programs provide an integrated focus on science and maths in real world applications. This allows us to emphasise particular content within the program to assist with curriculum links, but it also allows us to highlight career pathways and a combined approach to using maths and science skills in the workplace.

Many subjects other than Science and Maths have a high science and maths skills content. Some of these are Physical Education, Health, Technology (Fibre/Materials) and also the many applied science and maths electives such as forensics, sport science, psychology and career pathways.

Our theme also allows us to address ‘difficult to teach’ VCE topics in Physical Education and Biology which allows us to highlight the many medical, exercise and nutritional science career pathways for students with an interest in this area.

Participation by Curriculum Focus

2013 BioLAB attendees by age group.

<table>
<thead>
<tr>
<th></th>
<th>Primary yrs 5-6</th>
<th>Secondary yrs 7-10</th>
<th>VCE yrs 11-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>4742</td>
<td>3766</td>
<td>821</td>
</tr>
</tbody>
</table>

We have seen a large increase in program participation throughout our second year of operation. A total of 9329 students experienced onsite and/or outreach programs in 2013.

BioLAB programs are designed to focus on inspiring and engaging students in upper primary and lower secondary students and teachers. The participation data reflects this for 2013 with these groups (Years 5-6 Primary / Years 7-10 Secondary) making up over 90% of our visitation.

We also have a high participation in our VCE programs which are gaining popularity amongst Victorian schools.

The increase in participation can be attributed to a number of developments in the centre’s strategic focus, staffing, partnerships, program development and consolidation.
COMMUNITY & PARTNERSHIPS

We encourage our students to “think outside the box”, so we must also do the same.

BioLAB maintains strong community, industry and government ties and partnerships. We showcase the centre and its unique brand of educational programs to highlight the potential in the next generation and the wonderful work that is being done to promote engagement in Science, Technology, Engineering and Mathematics.

The following list is just a few of the many people from government and industry who we have been lucky enough to meet this year and provide an overview of what we do and how we do it!

- Prime Minister of Australia (now former) Hon. Julia Gillard
- Premier of Victoria Dennis Napthine
- Education Minister Martin Dixon
- Department Secretary Richard Bolt
- High Commissioner Britain His Excellency Paul Madden
- Ambassador of European Union to Aus/NZ David Daly
- Trade Commissioner/Consul General Melbourne Daniel Taylor
- Regional Director of South Western District Matt Dunkley
- Member for South Barwon Andrew Katos
- Committee of Geelong Executive Director Rebecca Casson
- Co-founding Director of Australian Sports Technologies Network Craig Hill
- Mayor of Geelong (now former) Cr Keith Fagg
- Australian Parliament MP Hon. Richard Marles
- Ripcurl Global Research and Development Manager Peter Coles
- Deakin University Vice Chancellor Professor Jane den Hollander
- Parliament of Australia Senator Hon. John Madigan
- CEO Barwon Sports Academy Cameron Loftus
- Geelong Football Club President Colin Carter
- Geelong Football Club CEO Brian Cook
- Deakin University Head of School, Exercise and Nutrition Sciences Professor David Crawford
- Deakin University Head of School, Engineering Guy Littlefair
- A partnership with the Geelong Football Club, Deakin University and support by Target saw the development and launch of “BioCATS”. A program that focuses on the science and mathematics of AFL Football.
- A professional development grant from the DEECD resulted in the development of our BioBLAST professional development program. This program aims to build teacher capacity and confidence in the teaching of science within 5 regional disadvantaged schools.
- Our “Materials Technology” program was developed and launched this year in partnership with Deakin University’s CADET program, Faculty of Engineering and an industry partnership with Ripcurl.
- A partnership with the City of Greater Geelong has seen the development of a BioLAB in a Box “Science of Sports Nutrition” program which will be piloted and delivered in 2014.

“Imagination is more important than knowledge.”

-Albert Einstein
We have a focus on playing an active role in our education and local communities and with partner organisations.

1. BioLAB hosted "Boardshorts under the Microscope" a seminar conducted by Dr Paul Collins as part of the Deakin Week. Dr Collins, team leader for sports technology at Deakin and project manager for the Deakin Quiksilver Research and Development partnership, spoke about the rise of sports technology and the work underway between Deakin and a range of research partners in developing the next level of performance equipment. This night was a great example of how primary, secondary and tertiary educators can work together to get kids excited about Science, Technology, Engineering and Math and highlight the many career pathways that are available.

2. Our Match Day Partnership with the Geelong Football Club saw BioLAB and its programs promoted to over 30,000 fans at Simonds Stadium. It also gave lucky students from our BioCATS program a chance to run through the banner with some of their favourite players.

3. Teach Next is an Australian Government initiative which provides an employment-based pathway into teaching for highly skilled professionals. This year BioLAB worked alongside partners Deakin University and Belmont High School to host the Teach Next participants and assist with the development and delivery of the Teach Next program.

4. We had a wonderful professional learning day with the DEECD Primary Science and Mathematics Specialists which saw participants get active with BioLAB’s Education Team. The specialists immersed themselves in three of BioLABs primary programs and looked at the use of inquiry based learning and technology applications.

5. The Geelong Football Club and Deakin University co-hosted a Sports Science Information Evening which looked at the inner sanctum of an AFL football club and the many science and maths careers in sporting organisations.

6. Our Centre director Yvonne Van Der Ploeg. Picture: MITCH BEAR

7. The former coach pleaded guilty to two counts of maintaining a sexual relationship with a child under 16 and attempted sexual penetration of a child aged 16. He instigated separate crimes from 1999-2000 and 24 at the time of the single counts of sexual penetration of a child aged 16. He convinced one victim to become a model, going to parties and attending that he enjoyed dinners with. He even informed fictitious penalties that apply.

8. The judge said he also believed that the coach was a role model and ‘big brother’ to his advantage. He instigated separate sexual liaisons with the four victims of a manipulative figure, his plea hearing was overhauled at the end of last year following two of them. He had betrayed the vulnerable and had betrayed the trust of their family and acceptance. 'A person under 18 is a victim of a manipulative young women who came for social and acceptance.'

9. He testified that the coach became so fused by sexual advances that he enjoyed dinners with and another to have a six-month sexual relationship when she was 14, and attempted sexual penetration of a child aged 16. The former coach pleaded guilty to two counts of maintaining a sexual relationship with a child under 16 and attempted sexual penetration of a child aged 16. He instigated separate crimes from 1999-2000 and 24 at the time of the single counts of sexual penetration of a child aged 16. He convinced one victim to become a model, going to parties and attending dinners with. He even informed fictitious penalties that apply.

10. The judge said he also believed that the coach was a role model and ‘big brother’ to his advantage. He instigated separate sexual liaisons with the four victims of a manipulative figure, his plea hearing was overhauled at the end of last year following two of them. He had betrayed the vulnerable and had betrayed the trust of their family and acceptance. 'A person under 18 is a victim of a manipulative young women who came for social and acceptance.'

 MEDIA INTEREST

Come Clean - making sporting drug scandals a learning experience.

Our Come Clean program generated a lot of school, community and media interest throughout 2013. It was featured in the Geelong Advertiser and the Herald Sun with interest also shown from radio station 3AW. This was mainly due to two performance enhancing drug scandals that broke in early and mid 2013.

Come Clean was designed to focus on the chemistry used to test athletes for performance enhancing substances. It also aims to increase awareness of testing procedures used by WADA and ASADA and highlights the various risks associated with usage of performance enhancing substances.

BioCATS creating a buzz about science and maths in the community.

BioCATS received a lot of attention throughout the year with feature articles appearing in The Geelong Advertiser, DEECD Inspire, Warrambool Extra, and the AFL Record Magazine.

The program also featured as a Match Day Partner at Simonds Stadium in August for over 30,000 football fans. BioLAB staff volunteered their time to run a number of fan activities during the game which showcased the science and mathematics of football.

BioCATS was designed to target disengaged students by focusing on popular and relevant themes and utilising science and maths skills in a novel environment.
Fast and the Curious

Fast and the Curious is one of our new 2013 outreach programs. This program uses physics to explore how forces can affect sporting performance. Students use technology such as timing gates, force platforms, dynamometers and radar speed guns to measure forces and test their skills. The BioLAB team successfully toured this program with many rural schools along the Surfcoast and also with local disadvantaged primary schools.

This program will be adapted to provide an early secondary version of the program in 2014 with many schools lining up to be hands on with the latest technology and to unlock the secrets behind “the force”.

BioLAB delivered exciting, hands on programs to over 3100 students in our Outreach program.

- Term 3 saw one of our most popular VCE programs hit the airwaves as BioLAB delivered the first of its Virtual Metabolic Madness program via video conferencing to Wycheproof High School. This program involved Sport Science staff from Deakin University and our resident athlete Anthony Goss.

- The BioLAB Team conducted two tours to the Warrnambool region this year to visit many primary and secondary schools. Our Term 2 visit to primary schools saw the piloting and development of the BioCATS program “Hit the Target” which was received with much enthusiasm from the students and teachers.

- Development has begun on our BioLAB in a Box: Sports Chemistry program. This is an inquiry based program where students use their scientific skills to unlock the secrets of a number of sporting supplements. In addition to engaging students in the chemical sciences, students will learn the skills to make educated decisions about nutritional and marketing claims that are in the world around them.

- For its second year BioLAB supported the Grampians regional schools by attending their annual camp to deliver our Beat That program. This tour also involved Earth Ed which was a wonderful way for two regional science specialist centres to combine forces and take their programs on the road.

“There are two ways to live: you can live as if nothing is a miracle; you can live as if everything is a miracle”
- Albert Einstein
Materials Technology

Term three saw the launch of our exciting new partnership program, Materials Technology.

This program was developed in conjunction with Dr. Paul Collins from Deakin University’s Sport Technology, Deakin CADET Engineering team and industry partner Ripcurl.

In this program, students explore the technology that is used to test materials for the development of cutting edge surfing equipment from concept to consumer. The mix of science, mathematics, design and innovation has broadened our client base, attracting the attention of design and technology domains within secondary schools.

Sprinters Gene

This year also saw the launch of our first biotechnology program, Sprinters Gene. Targeted at a VCE Biology audience, students experienced first-hand genetic screening techniques and developed an understanding of the increasing demand for screening within the sporting world.

The cross over of medical advancements into the sporting arena were explored in the investigation on gene doping as a means of performance enhancement. The students put their skills to the test using genetic manipulation techniques to gain a deeper understanding of this issue.

Over 6200 students experienced onsite programs at BioLAB throughout 2013.

Here’s an update of developments in our most popular 2013 programs.

1. Primary Come Clean challenges students to uncover the pre-race preparation of BioLAB’s mystery athletes. It hones their science communication skills by developing and delivering evidence-based arguments in a BLADA (BioLAB Anti-Doping Agency) conference on the way athletes get the edge.

2. Secondary Come Clean is BioLAB’s very own peptide testing program. It enables students to understand the distinction between the assortment of peptides and proteins that exist in nature and those that are manufactured synthetically. It was fantastic to see students enjoying the experience of both catching a drug cheat through their testing procedures and surprising themselves with how much they enjoyed putting their science skills into practice as Testing Officers.

3. In the VCE arena we saw students from a variety of sporting backgrounds pushing themselves to the limit in Metabolic Madness. These students obtain a rare insight into the way their bodies utilise oxygen and are able to quantify their maximum oxygen consumption. This experience not only enables students to participate in a gold standard test that is conducted on athletes but also enables them to observe sport science and medical science careers pathway in action.

4. The use of physiological sensors was a winner with secondary students in the Human Machine program. Gathering and interpreting their very own primary data on their body’s acute respiratory, cardiovascular and muscular system response to exercise.
It might only take a small spark of inspiration to ignite a lifetime of interest in science and mathematics.

We want to capture the imagination of students and draw a clear link between science, maths and the real world.

The exciting new BioCATS program, has been developed this year in partnership with the Geelong Cats, our Lead Partners Deakin University and supported by Target.

It is an engaging full day experience for primary students and is delivered from the new Deakin Cats Community Centre at Simonds Stadium. Students have been particularly engaged in learning about the way in which science, technology and mathematics has helped to shape the game of football.

Students learn about skills analysis, nutrition, physiology, materials technology and the analysis of data through the use of statistics.

Each student gathers real time GPS data on their speed in comparison to their favourite Cats players. They also learn that a scientific and mathematics career pathway could see them working for AFL clubs at every match, which has proved to be motivating for many!
BIOLAB: The Victorian BioScience Education Centre is proudly supported by lead partners Deakin University and is hosted by Belmont High School, in Geelong Victoria.