



*Bringing the environment and sustainability to life*

Engage Discover Inspire

# 2018 Annual Report



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# Context

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 state-wide network. Ecolinc's area of specialisation is on the environment, sustainability and conservation.

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

Ecolinc is one of Victoria's six Science and Mathematics Specialist Centres established by the Department of Education and Training (DET) (see below).





## About Ecolinc

Ecolinc opened in 2005 and is hosted by Bacchus Marsh College. The Ecolinc logo is a stylised Growling Grass Frog (*Litoria raniformis*), a threatened Victorian species which was first observed in the Ecolinc stormwater wetland in 2007. The wetland provides habitat for a range of native flora and fauna, including a variety of vertebrates and invertebrates and is used extensively as part of our programs.

The name Ecolinc refers to the links between the Centre, schools, tertiary institutions, related government and environmental organisations and the community, in relation to the environment and sustainability.

Ecolinc provides onsite, online and outreach programs as well as field trips in the surrounding areas. We utilize innovative technologies, the building's ecologically sustainable design elements and the natural resources of the surrounding area to provide a wide range of educational programs for F-12 students, teachers and the community. All programs are aligned to the Victorian Curriculum and VCE and provide engaging, unique and 'hands on' learning experiences based around 5 key themes:

*Life*

*Water*

*Air*

*Energy*

*Earth*

In 2018, 18,973 students either visited the Centre or participated in an outreach program or a fieldtrip. Our aim is to engage and inspire the next generation to pursue careers in the STEM pathways.





## Director's Message

2018 has been a remarkably busy and successful year for Ecolinc with over 18,000 students participating in an Ecolinc program either onsite or via outreach. Once again, this is a great testament to the work that the Ecolinc staff are doing to provide high quality, innovative environmental education programs for Victorian school students.

2018 saw the continuation of the building extension program at Ecolinc which was completed at the end of term 3. Moving into the new classrooms and the new office area was indeed a significant highlight for us and has allowed for greater capacity and flexibility with our programs. With reduced onsite capacity in terms 1-3, we turned our focus more on delivering Outreach and also to developing content for our new online Learning Management System.

A particular focus in 2018 has been on the delivery of professional learning for primary school teachers as part of the Ecolinc STEM Teaching and Learning Coaching program. The network of specialist centres applied for and were successful in obtaining a grant from the Department of Education and Training to deliver professional development to teachers on improving science pedagogy and science content. A number of professional development programs were delivered throughout the course of the year as well as providing intensive ongoing support to teachers from our 2 Ecolinc coaches. One of the great highlights of the professional development program was 'Climate 101' where guest speakers Professor Tim Flannery and Rod Quantock spoke on the impact of climate change and the state of our planet.

In addition to delivering a range of new programs in 2018, we also held a number of special events including the Emerging STEM for Women program in June and October, a UN Conference on climate change, The Aark and a new program delivered in partnership with the Flying Robot School where students use drones to scan the Werribee River to determine whether it is a suitable habitat for the platypus. Our special programs have proven very popular and are booked out well in advance.

I would like to take this opportunity to acknowledge and thank our dedicated and hardworking Ecolinc staff, the schools who support us with their attendance, our partners and our Ecolinc board for your commitment in continuing to make Ecolinc a centre of excellence in science education.

Linda Flynn  
Ecolinc Director.

# Our Vision, Purpose and Values

## Our Vision

Bringing the environment and sustainability to life

## Our Purpose

- To demonstrate excellence and innovation in science education in the areas of environment and sustainability.
- To provide unique and exciting opportunities for students in the Science, Technology, Engineering and Mathematics (STEM) areas that will encourage students to pursue career pathways in these areas.
- To provide high quality professional development in STEM in order to build collective capacity.
- To develop and sustain strategic partnerships that will provide significant additional value to the learning & teaching experience.

## Our Values

Engage      Discover      Inspire.



*Bringing the environment and sustainability to life*

Engage      Discover      Inspire

# Our Staff

The integrity of a Specialist Science and Mathematics Centre and its ability to deliver high quality learning and professional development programs is reliant on its ability to attract, employ and retain suitably qualified and experienced staff. Ecolinc staff are highly skilled practitioners and education support staff who deliver programs that cannot be replicated in the 'normal' classroom. In 2018, Ecolinc employed 9.1 Equivalent Full Time (EFT) staff, plus 2 staff on a casual basis undertaking outreach.

Role	Staff	EFT
Director	Linda Flynn	1.0
Assistant Director	David Tait	1.0
Education Officers	Carolanne Glynne	1.0
	Bob Hartmann	0.6
	Anthony Fernando	1.0
	Nicole Mason	0.5
	Colleen Filippa	0.6
Outreach Officers	Sophie Pritchard & Ainsley Bellette	Casual
Admin Officer	Julie Gogeff	1.0
Horticultural Technician	Tyrone Cain	0.5
IT Technician	Son Do	1.0
Lab Technician	Patrice Kennedy	0.9
LMS & Special Programs	Jo Tate	External

The Director and all of the Education Officers are qualified teachers who design, develop and deliver onsite and outreach programs. This includes the development of online resources and teacher professional learning programs. This is often carried out in collaboration with education, science and mathematics experts to ensure contemporary and effective STEM and education practices are applied. Our education and support staff have rich and diverse backgrounds and demonstrate a strong commitment to improving student learning outcomes.



# Onsite

Throughout 2018 Ecolinc staff have developed three new programs to add to our existing suite of onsite programs:

## Fair Dinkum Dinosaurs Year 5 & 6

This program focuses on Australia's Dinosaurs, their unique features, where they lived and what Palaeontologists have learnt about them through fossils, bones, footprints etc



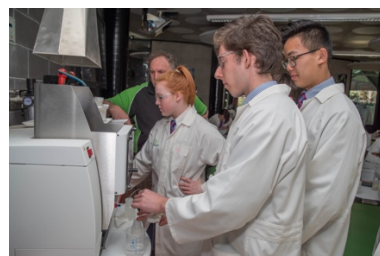
## Seeds from Schools Year 5 & 6

Students participate in a hands-on project that spans 3 sessions over the course of the year. Students will learn about grassland flora, propagate plants and revegetate an area of their school and then harvest the seeds. This program is limited to metro disadvantaged and rural schools.



## Marsupial Milk Year 9 & 10

Students learn about the importance and composition of marsupial milk for infant marsupials. Students use the AAS and UV Vis to determine the calcium and protein content in marsupial milk formulas.

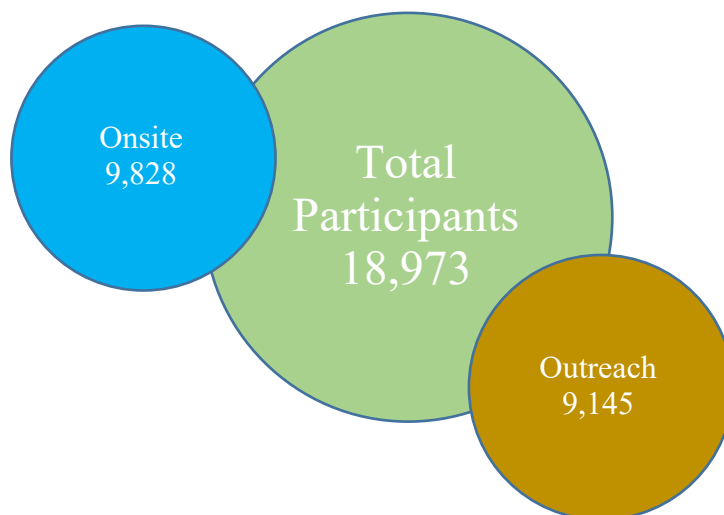




## Participation

Ecolinc had 18,973 students participate in either an onsite, outreach or field trip in 2018.

**Figure 1: 2018 Participation numbers by group.**



**Table 1: Percentage of student participants by category – Onsite programs.**

Year	Rural (R)	Metro Disadvantage (MD)	Metro Non/Government Standard* (SR)
2013	35.90	33.56	30.54
2014	31.99	42.61	25.40
2015	42.42	34.40	23.18
2016	34.01	42.61	23.38
2017	33.46	49.04	20.50
2018	46.85	36.24	16.91

- *Standard students as defined by Specialist Centres Funding Model includes schools in the Moorabool LGA.*

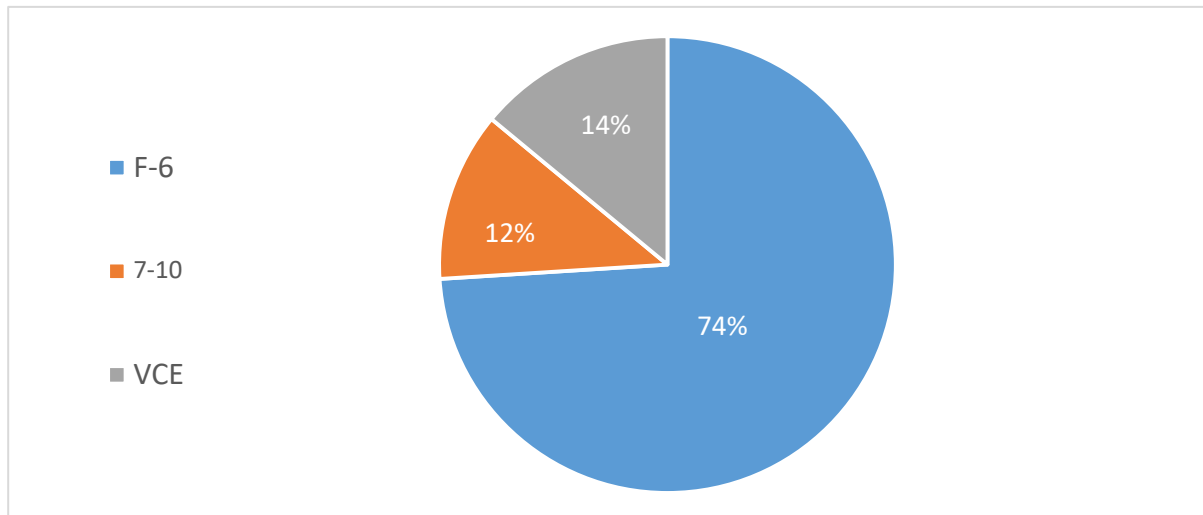
**Table 2: Percentage of participants by Government & Non-Government Schools – Onsite programs.**

Year	Government	Non-Government
2013	75.78	24.22
2014	78.88	21.12
2015	79.07	20.93
2016	81.60	18.40
2017	82.64	17.36
2018	84.42	15.58

## Engagement

The largest percentage of student onsite participants have come from the primary school cohort group. The lowest percentage of students coming from the 7-10 cohort group.

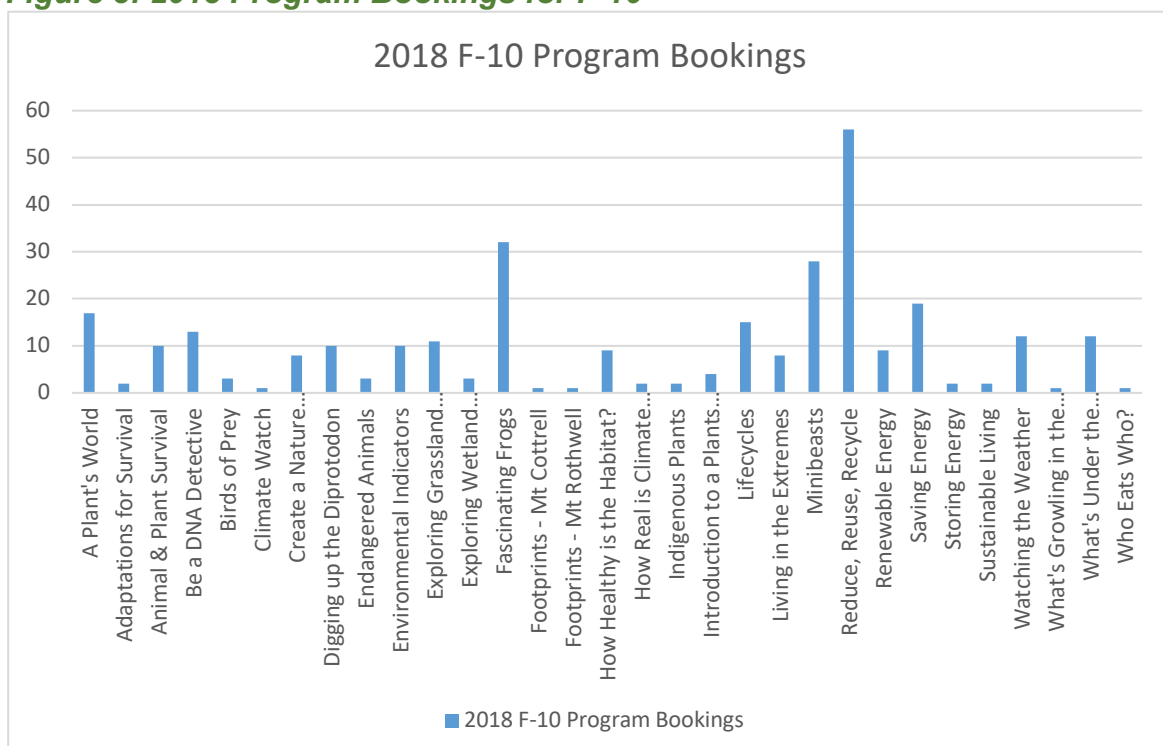
**Figure 2: Percentage of student participation by cohort group.**



## Impact

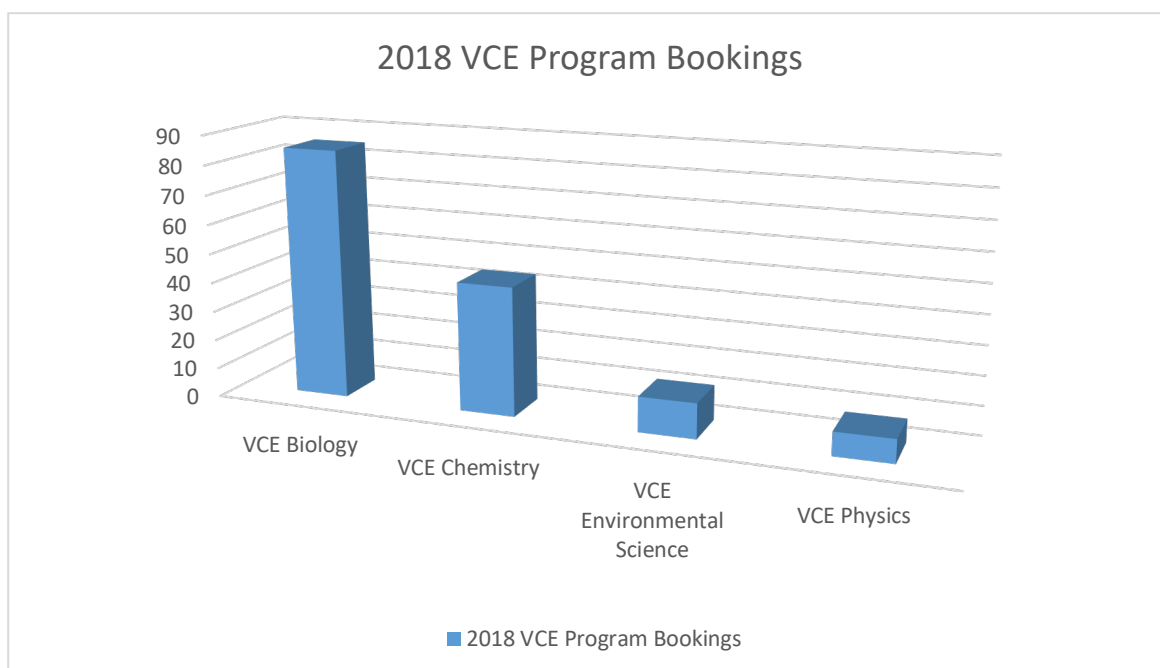
Ecolinc delivered 31 distinct onsite curriculum programs F-10, 16 VCE programs and 12 Outreach programs in 2018. The most popular onsite F-10 programs were Reduce, Reuse, Recycle (F-4), Fascinating Frogs (F-2), Minibeasts (F-4) and Saving Energy (5-6).

**Figure 3: 2018 Program Bookings for F-10**



Of the VCE programs, VCE Biology had the highest number of bookings.

**Figure 4: 2018 Program Bookings for VCE**



## Volunteers

Ecolinc would like to thank our Uni student and community volunteers for their assistance throughout the 2018 and to acknowledge the valued contribution and difference they make to the learning of students who visit the centre.

# Outreach

Ecolinc offers Outreach programs through three delivery modes:

- Outreach incursion programs: these are available to eligible primary schools and are conducted by an Ecolinc Education Officer as part of a pre or post visit to Ecolinc, or as a stand-alone program and are usually offered to schools within a 1 ½ hour radius of Ecolinc.
- Rural/Remote outreach tours: these are available to selected rural areas where Education Officers visit a range of schools in a selected area and provide an incursion experience. Ecolinc has developed a 5 year outreach tour plan to ensure that all Victorian Regional centres are covered across the 5 years.
- Online programs: a range of online outreach programs and resources are available on the Ecolinc website.

All programs are aligned to the Victorian Curriculum.

We strive to find new and unique ways to best engage and interact with a broad cross section of students and teachers from across Victoria. We have seen a significant increase in rural schools accessing our in-house programs and we continue to focus on rural and metro disadvantaged students with our outreach programs.

In 2018, Ecolinc provided:

- Outreach Road trips to Mildura, Warrnambool district and Bairnsdale/Sale/Traralgon
- A designated Outreach Officer in the SWV Region to service areas in this region beyond the 1 ½ hour radius of Ecolinc. This strategy was initiated in anticipation of lower onsite attendance due to the continuation of building works as part of the Ecolinc extension and the resulting decommissioning of one of the existing classrooms.

**Table 3: Outreach Participant numbers by term.**


Outreach Participants				
	Term 1	Term 2	Term 3	Term 4
Full Day	1315	3076	2259	1663
Half Day	316	269	107	65
Quarter Day				
Total Participants	1631	3345	2366	1803
Total FTE	1473	3210.5	2312.5	1770.5



# Online

As part of our commitment to providing Victorian teachers and students with quality programs and resources, Ecolinc has been working with our website developer to develop an online learning management system called '*Ecolinc Learn Online*' to further support teachers in schools with curriculum resources, activities and courses. 2018 saw the development of the interface and functionality of the LMS and the development of a range of online learning programs.

***Ecolinc Learn Online*** will allow classes who are booked into Ecolinc to do an onsite program to undertake either pre or post activities, or for schools who are unable to come to Ecolinc, to do a stand-alone online program.



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### Environmental Learning Online

Offering a range of exciting interactive learning options from your own classroom

**Innovative Curriculum Programs**

Ecolinc Learn online is a virtual outreach of the Ecolinc Science and Technology Innovations Centre offering online courses for students and teachers in Prep to Year 12. Prep to Year 10 courses cover the themes Life, Water, Energy, Air and Earth, VCE courses cover Biology, Chemistry, Environmental Science and Physics. Some of the courses offered will prepare students for their booked on-site programs, others provide for follow-up learning in the classroom.



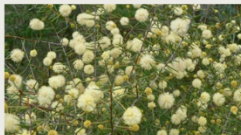

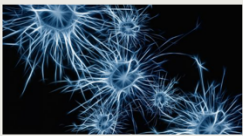





**Filter by:**

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WHAT'S NEW    A-Z

 <p><b>Space Junk</b></p> <p>The International Space Station(ISS) recently sprang a "minute pressure leak" two millimeters wide. While no [...]</p> <p><a href="#">Read more about course →</a></p>	 <p><b>Safe Labs</b></p> <p>Will you be using an Ecolinc lab in the near future? The hazards encountered in a science laboratory are many and varied. Be prepared.</p> <p><a href="#">Read more about course →</a></p>	 <p><b>Eco Explorers</b></p> <p>There are many rare or threatened plant and animal species occurring in grassland ecosystems, and as communities, grasslands are classified as threatened.</p> <p><a href="#">Read more about course →</a></p>	 <p><b>Darwin to DNA</b></p> <p>Evidence of biological evolution is abundant. It is highly probably that evolution has occurred and is still occurring today.</p> <p><a href="#">Read more about course →</a></p>
 <p><b>Rapid Response</b></p> <p>This course introduces students to essential biology around animal response by exploring the central nervous system.</p> <p><a href="#">Read more about course →</a></p>	 <p><b>Decoding DNA</b></p> <p>This course involves a detailed look at how nucleotides make up the DNA molecule and familiarizes protein synthesis.</p> <p><a href="#">Read more about course →</a></p>	 <p><b>Dating Dinosaurs</b></p> <p>'Dating Dinosaurs' uncovers the secrets hidden in fossils. Meet some engaging Australian paleontologists digging in the field.</p> <p><a href="#">Read more about course →</a></p>	 <p><b>Dinkum Dinosaurs</b></p> <p>Discover the wondrous Australian dinosaurs who left their tracks in time during the Cretaceous Period.</p> <p><a href="#">Read more about course →</a></p>

# Professional Learning

Ecolinc held two professional development days in **term 1** as part of the Ecolinc STEM Teaching and Learning Coaching program. The target audience was primary schools.

- **STEM Schools Community of Practice Introduction to Coaching - Monday February 5<sup>th</sup> 2018.** The day explored some of the challenges that schools are facing in the STEM area and showcased two 'good practice' schools, Canadian Lead PS and Bacchus Marsh PS.
- **Hands on STEM - Tuesday 13<sup>th</sup> March 2018.** The day featured keynote presenter Dr Kathy Smith and a range of 'hands-on' STEM workshops that participants could engage in.





In **term 2**, Ecolinc ran a further two Professional Development opportunities.

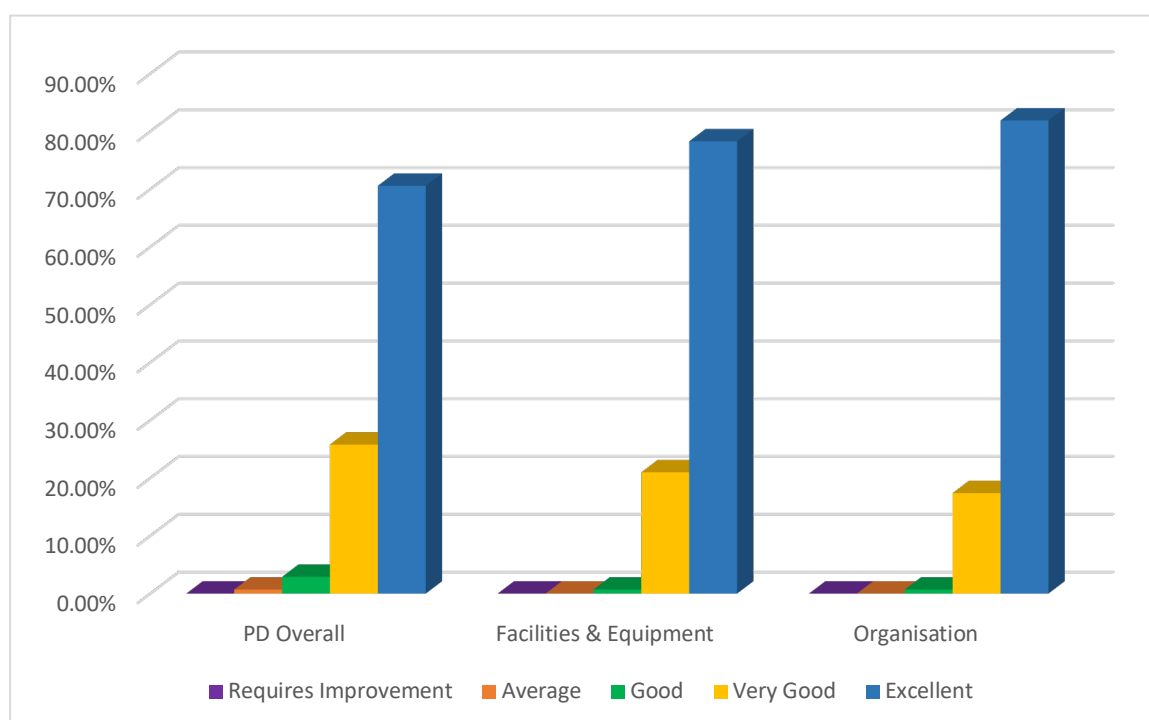
- **STEM Inquiry Learning – Wednesday May 23rd.** The day consisted of a keynote address from Yvonne Reilly and Thao Huynh from Sunshine College titled ***“Getting bang for your buck! Teaching approaches that support deep understanding.”*** Participants were then able to engage in a range of sessions/workshops based around inquiry learning.



- **Climate 101: Understanding Climate Change – Monday 18<sup>th</sup> June.** Keynote speakers Professor Tim Flannery and Rod Quantock spoke on the impact of climate change and the state of our planet. In addition, experts in the field who are seeing and living with the impact of climate change on a daily basis also told their stories including: a firefighter; a healthcare worker, a marine scientist, a meteorologist and a scientist from the Antarctic Climate & Ecosystem CRC. Questions such as why is it happening, what is the data telling us, who is being impacted and what can we do, were also discussed.



**Figure 5: 2018 Teacher Professional Development Survey Results**



**Teacher Testimonial:**

*Thank you for an informative and inspirational day. It gave me an understanding of the wide scope STEM covers and how we can embed STEM throughout the teaching and learning at our school. (Feb 2018)*

**Teacher Testimonial:** *I got so much from today. The enthusiasm really excites me to take what I have learned and to apply to my school. (May 2018)*

**Teacher Testimonial:** *It was great to be able to sit down and dedicate some time to thinking about STEM and how this fits into our context as well as sharing with other schools who are facing similar battles and are on the same path. (Feb 2018)*



# Partnerships

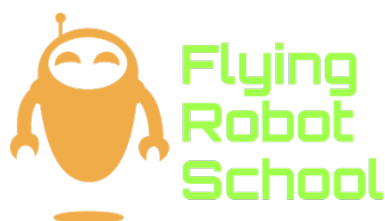
Ecolinc would like to acknowledge and thank our university, industry and school partners and affiliates for their continued support and involvement with Ecolinc:



## Flying Robot School:

Ecolinc has also partnered with the Flying Robot School to offer a specialized program for students in Year 9 in 2019. Students will have the opportunity to learn how to fly drones and take aerial habitat survey photographs of the Werribee River in order to ascertain whether the Werribee River is a conducive habitat for the platypus.

This program is offered to rural schools only.



## Cardinia Environment Coalition/Cardinia Shire Council:

The Cardinia Environment Coalition, the Cardinia Shire Council and Ecolinc have been working together throughout 2018 and have entered into a partnership with the aim of delivering environment education programs. The Shire of Cardinia is a local government area in Victoria, Australia, in the south-east of Melbourne between Western Port and the Yarra Ranges on the outskirts of Melbourne.

Significant funding was obtained by the Shire of Cardinia and the Environment Coalition to build an Eco-Centre at the Deep Creek Reserve in Officer. The building program commenced in 2018 and has an expected completion date of mid-2019. Ecolinc is looking to develop and deliver environment and sustainability programs, both onsite and outreach, from this site which will enable schools in the south eastern suburbs the opportunity to access Ecolinc programs without having to travel significant distances.

The facility includes a demonstration wetland, eco-playground, indigenous plant nursery as well as the education centre.



## TechnEcology:

Ecolinc is working with Deakin University and the Melton City Council to develop a new initiative called TechnEcology which will look at ways that we can use technology to enhance people's awareness of the environment, biodiversity and its threats.

This network brings together the expertise of Deakin's researchers in ecology, engineering, IT etc, as well as Ecolinc's educational expertise and the Melton City Council's work and experience in the environment management area, to accelerate the collection of wildlife data that can be used to generate strategies to reduce biodiversity loss and increase society's engagement with our natural heritage.

The aim of TechnEcology is to leverage a range of new technologies to monitor nature, including engaging citizen scientists and evaluating the benefits for conservation, health and well-being. This project commenced late in 2018 and will continue into 2019.



# Other Programs:

## Emerging STEM for Women:

Ecolinc held two 'Emerging STEM for Women' program days in 2018, one in June and one in October. On both occasions, 90 girls from Year 9 & 10 attended to listen to inspirational speakers, participate in a range of 'hands on' emergent science workshops and take part in a Careers Speed Dating session.

The students that participated in each of the program days were from a range of schools, representing the government, independent and catholic sectors.

The keynote speakers in June were:

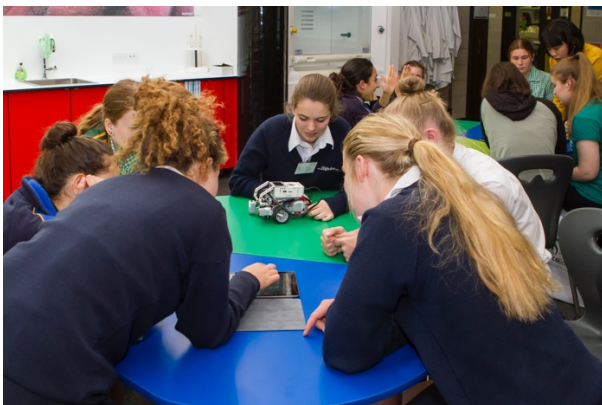
- Jaime Gunther, Full Stack Developer at Envato
- Lydia Low, Senior Education Officer at PrimeSCI Victoria.





The keynote speakers in October were:

- Joanne Taylor, Manager of Natural Science Collections, Museums Victoria
- Ruby Chan, winner of the Green Innovators Award in 2017.



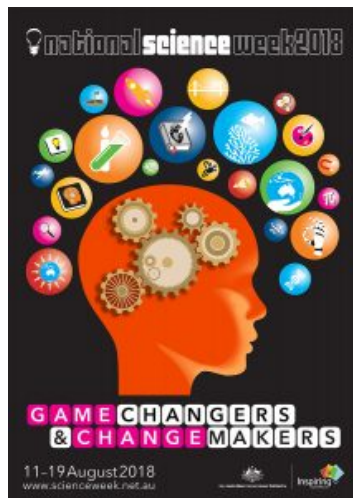
The Emerging STEM for Women program is proudly supported by *Women in STEMM Australia* and we thank them immensely for their support and commitment to our program.



Ecolinc would like to also acknowledge and thank the many dedicated and supportive women who contribute voluntarily as guest speakers and speed daters to our Emerging STEM for Women program each year.



## Science Week (13<sup>th</sup> - 17<sup>th</sup> August):



The 2018 Science Week theme was Game Changers & Change Makers.

Ecolinc ran a number of events across the week including:

- **Monday 13<sup>th</sup> August:** Model UN Conference

120 students Year 10 – 12 from a range of schools (government and private) participated in a mock UN Conference on the topic of “Combating Climate Change: Committing to Global Action”.



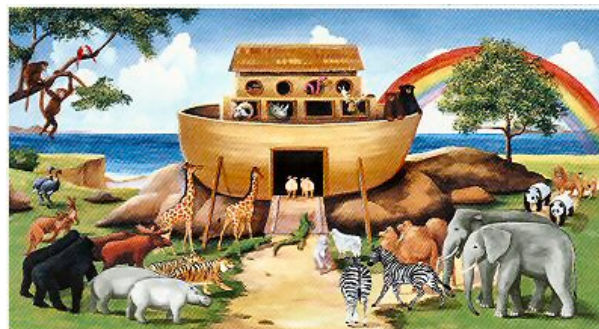
- **Wednesday 15<sup>th</sup> August:** “Mars Mission”

This was a joint Specialist Centres program which was held at the Victorian Space Science Centre.

- **Thursday 16<sup>th</sup> August:** Primary School Activities program from 4.30 – 6.30pm and a community presentation from 7.00 – 8.00pm featuring Dr Stephen Poropat, a leading Australian palaeontologist.



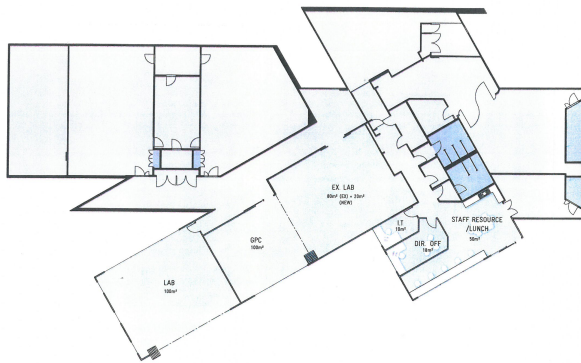
- **Friday 17<sup>th</sup> August:** The Aark program - A cataclysmic climate event has occurred; the government has managed to save the people but the animals are in peril. Students from Beaufort SC and East Loddon P-12 engaged in a range of problem solving activities to respond to the moral dilemma of which animals are able to be rescued and which are not, as they put together a rescue plan called The Aark.



# Other Highlights

## Building Program

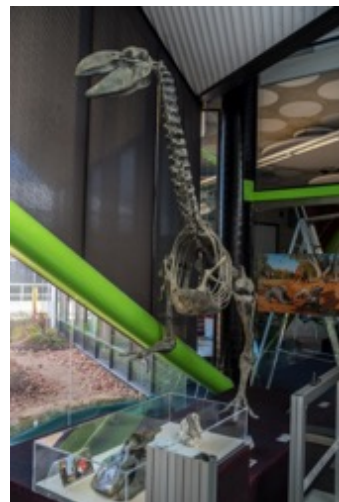
Building extension works were completed in September 2019 and we were very excited to move into our new classrooms, conference space, new Chemistry lab and staff work spaces in Term 4. This addition to Ecolinc will allow for increased booking flexibility in 2019 and beyond.



## A New Face at Ecolinc!

In December, we had the very great pleasure of welcoming Dr Pat Vickers-Rich, a renowned palaeontologist from Swinburne University, and her team visit Ecolinc to erect a skeleton of an Australian dinosaur called a Bullockornis in our front foyer.

The Bullockornis features in our new program called 'Fair Dinkum Dinosaurs'.





## Seasonal Dreaming Mosaic Panels

Ecolinc's habitat garden was enhanced greatly by the acquisition of 4 mosaic panels depicting the changes in the seasons on the Western Volcanic Plains. Designed and made by two local artists, Chris Cocking and Jill Guerts, this fantastic piece of art took 18 months of painstaking research and work to put together. The panels portray the animals, plants and landscape features of the Western Volcanic plains in summer, autumn, winter and spring.

Not only will the panels give added colour and interest to the Ecolinc habitat garden but students will also be able to analyse and learn from them as they participate in the Watching the Weather program and others.



**Figure 6: Ecolinc's facebook page:**

