

SASTA Journal

Number 2 **2020**

Science Education on Kangaroo Island

Oliphant Science Awards: Prize winners

The story of an Oliphant Trophy Winner: Phoebe's *Anchiornis huxleyi* journey

Photographing Nature: Student photographers share their thoughts

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Cover Image

Title: Bushfoods – A Rainbow of Australian Native Nutrition

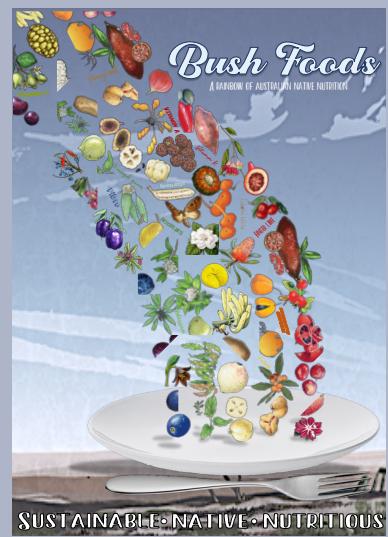
Artist: Josephine Oehler, Seymour College

For my poster Bushfoods – A Rainbow of Australian Native Nutrition, I was inspired by the variety of native foods available in Australia. This sparked an idea to produce a poster based around the idea and phrase ‘eat the rainbow’.

The poster features at the focal point a rainbow consisting of a collage of illustrations of Australian native food - including various native fruits, greens and insects cascading onto a plate. This is set onto the backdrop of the Australian outback, which utilises muted tones to allow the rainbow to stand out.

I hope the poster is able to generate a greater appreciation and understanding of the huge variety of native food available in Australia.

Josephine’s poster received a High Commendation in the Poster Category, Oliphant Science Awards 2020.



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Editorial

Brent Banham, SASTA Journal Editor

This year marked the 39th year of the Oliphant Science Awards, making next year the big 40!

This edition of the Journal celebrates this year's Oliphant Science Awards. Inside these pages you will find lists of all the prize winners in the different categories. Thank you to the organisations that sponsor so many prizes – it very generous; very much appreciated; and your contribution goes a long way to further enhancing the value of the Oliphant Science Awards and the perception of SA Science as a single, connected community.

Within this edition: Last year Phoebe Wood, aged 11, won the Oliphant Trophy and Phoebe's mother Jo catches us up on the amazingly eventful year that Phoebe has had since. Also, some of this year's prize winners in the Photography category of the Oliphant Science Awards give us their tips on nature photography. We also hear from some of our teacher peers who judge different categories of the Oliphant Science Awards. They share their thoughts on why the Oliphant Science Awards are so special; the rewards that come from judging; and give their own tips on what makes for a good Oliphant entry.

An ambition of this Journal, now realised in this edition, has been to share thoughts on science education from different school districts, including regional SA. Rachel Pillar, Bec Vogt and other staff from Kangaroo Island Community Education (KICE) have contributed to give an overview of science education on Kangaroo Island (KI). Their article shows KI as an exemplar of the importance of community involvement when looking to realise the potential our natural environment offers up for environmental education. We appreciate their writing, particularly given KI has been so knocked about this year. It is a reminder of how fortunate we are to have a place such as KI as part of SA.

Events of 2020 have hastened the move to (some) education services going online. The Oliphant Science Awards is one example of this. One of the hopeful benefactors out of 2020 will be SA regional schools, as entries for now even more Oliphant categories (more than was previously the case) can be submitted online. Distance is no barrier to entry in the Oliphant Science Awards and in this edition, we hear from some country schools who are currently involved with the competition. May there soon be many more such schools.

Do you think enough educators are recognised for Australian honours? Do we think to nominate each other? This year it was a delight that Associate

Professor Maria Parappilly from Flinders University was awarded a Medal of the Order of Australia for her involvement in encouraging women of all ages to work in Physics-related fields. Maria shares some of her thoughts in these pages.

Last edition of the Journal looked at Citizen Science opportunities for schools in SA. In this edition, Bill Flynn, our own prized SA-based education specialist with the CSIRO, picks up on this theme with an overview of the international GLOBE program which is supported here in Australia by the CSIRO.

Many science teachers in SA will have fond memories of learning our profession in the company of Associate Professor (retired) Chris Dawson, Adelaide University. Recent editions of this Journal have included science activities shared from two of Chris' books published by SASTA and available on the website – Watch this! and Watch this too! Look for two more activities shared by Chris in this edition.

You will have noticed SASTA's new website? Let me draw your attention to the exciting fact that SASTA Journals are available in the Members Area of the SASTA website, listed under the menu item, Publications. Recent editions have been turned into searchable flip books, making the journals much easier to view, download or share. The electronic copy of the Journal is available to all members – it is yours – as part of your membership! Should you desire a printed copy of the Journal, that option exists but at an additional cost to cover printing. Thank you to the SASTA staff and Board for making this publication so available on the website.

The SASTA Journal exists for you and for anyone with an interest in primary and secondary science education in SA. There is much going on in SA that deserves and needs to be shared. Look back over recent editions of the Journal and I hope you will share that view. If there is anything you hear of or wish to see in the Journal then you simply must raise it – forward a note to journal@sasta.asn.au

In closing, it's my pleasure to also mention that electronic copies of Teaching Science, the Journal of the Australian Science Teacher Association (ASTA) are also now available on the SASTA website for SASTA members.

From the President

Dr Jane Wright, SASTA President



difficulties in judging; less teacher involvement; and the cancellation of ceremonies.

The number of significant changes made to our processes and procedures this year because of COVID-19 was mind-blowing, adding complexity to an already complicated process. Multimedia, Science Writing, Scientific Inquiry entries and reports for Computer Programming, Apps and Robotics were submitted online this year. Computer Programming, Apps and Robotics entries were still able to be judged onsite as Pulteney Grammar School kindly gave us access to a much larger venue. This, together with a limitation on accompanying persons, allowed appropriate social distancing. As well, the spacious venue at Festival Functions provided appropriate social distancing for judging of the Models & Inventions, Posters, Photography, Crystal Investigations and Games. Finally, thorough planning successfully enabled the significant logistical challenges of the drop-off and collection of entries to be negotiated in a seamless fashion.

The resounding success of OSA this year was due in no small part to the incredibly detailed planning and organisation of Becci Van Schuilenburg, our Events Coordinator, supported by her colleagues in the SASTA office, Rebecca Cooke and Tegan McClean, all ably lead by our EO, Kate Dilger. Of course, the OSA Committee, led by Peter Turnbull and Gerald Little, as well as their many volunteers and helpers, contributed enormously to both the planning and smooth running of every aspect of the Awards. All these people, together with keen students, parents and teachers, helped make OSA 2020 a stunningly successful event.

Becci should also be congratulated on her work in producing additional materials for the Awards. She invested significant effort into the development of a range of website resources (videos, worksheets, blogs) to support teachers and students working on OSA entries. While these initially came about in response to COVID-19 restrictions earlier in the year, they will also have long term value in supporting future entries to our competition.

While we have been fortunate that many aspects of teaching and learning in South Australia have not been seriously affected, other states and countries have not been so lucky. Nevertheless, the pandemic has taught us much of value over the last 9 months. Our use of technology has improved enormously and a huge amount of useful research has been done on transmission, treatment and vaccines.

In an important study carried out in Australia, the CSIRO was able to show that bank notes, mobile phones, ATMs and supermarket self-checkouts can carry the virus for at least 28 days. While the virus is very robust at 20°C (around room temperature), surviving well on smooth surfaces like glass, steel and vinyl, they reported that it lasts just 24 hours at 40°C. Researchers believe that these results are able to explain why cold environments like meat processing centres have shown such high rates of transmission between workers.

Measuring the effects of vaccines and treatments on human health presents much more complex issues. Ethical problems can prevent the allocation of people to an experimental group that receives the treatment and a control group that does not. Investigations trialling vaccines in humans do not include deliberate infection of individuals for obvious reasons.

This type of methodology can make interpretation of the results very difficult. When President Trump tested positive for the virus, doctors used a cocktail of treatments that included Dexamethasone, (a steroid), Remdesivir (an antiviral) and Regeneron (a monoclonal antibody). Although he chose to credit his recovery to Regeneron, with three independent variables and no control, it is impossible to know if this is in fact true. This account could be used in classrooms to demonstrate the importance of changing only one factor in an investigation, a requirement that was clearly understood by virtually every student, no matter their age, in their Oliphant Science Awards entry in the Scientific Inquiry category.

While some leaders have a poor understanding of science inquiry, also concerning is their lack of respect for scientific knowledge and opinion. This should not be confused with the tension, seen in the actions of leaders and governments throughout the world, that exists between political imperatives, economic drivers and the knowledge and understanding of scientists and doctors.

All these factors together have made 2020 a very challenging year for all of us.

Opinion: Empowering young women to progress in STEM

This year Maria Parappilly was awarded an Australian honour (Medal of the Order of Australia) for her encouragement and support of women of all ages in STEM disciplines in South Australia. We asked Maria if she would share some of her most recent thoughts and activities.

**Associate Professor Maria Parappilly, OAM
Flinders University, College of Science & Engineering**

The future of the world will be shaped by STEM disciplines, so it has never been more important for our students to learn science.

Today's young people are wonderfully committed to improving the environment. They are concerned about issues like climate change, protecting our species from habitat loss and extinction, and feeding the world as populations grow. But advocating and calling for change will only go so far. By learning diverse STEM skills, they can help find solutions to challenges like sustainable energy, and contribute to the economic growth in global industries such as defence, space, quantum technology and renewables.

Yet we are still finding so many high school students, and particularly girls, abandon these studies once they start to focus their subject choices in Years 10 and 11.

As a physicist with a passion for advancing women in STEM, I am focused on making physics more accessible, inspiring girls to set their sights on STEM futures and careers through the enrichment programs I lead.

I do not believe young women decide in their teen years they are no longer interested in the wonders of science.

We know the reasons for discontinuing science are varied, but frequently relate to perceptions of science being difficult. Students can also struggle to reconcile introductory studies to the real-world issues they are interested in. Then they are influenced by peers, who - with limited knowledge and foresight - might pursue subjects they perceive as easier, or more fun.

There are also well-meaning parents who share their childhood struggles with maths or science, and own inclinations towards other areas and their subsequent non-STEM careers – unwittingly sowing seeds for their children's choices.

But today's technologically-charged world is changing careers and making many jobs redundant.

My goal is to make STEM careers more inclusive and reduce the underrepresentation of females, particularly in engineering and physics.

Five years ago, I founded Flinders University's STEM Women Branching Out group - a first of its kind in South Australia - that supports women researching and teaching in STEM and delivers initiatives for school students.

We run a Federal Government-funded STEM Enrichment Academy for Year 9 girls and the outcomes have been exciting. This initiative encourages young women to consider STEM careers by engaging them in activities that underline the benefits and opportunities of STEM studies, before they close off their options.

The Academy program is based on three enrichment methods; Real Science, Design and Technology, and a STEM Enrichment conference, managed through Flinders University. It also investigates the effectiveness of enrichment methods for Year 9s interested in STEM, giving us insight into where and why the pipeline leaks, and providing useful data to support initiatives that meet real-world needs.

The Real Science Enrichment consists of eight monthly workshops, each focused on a different field within the broader umbrella of STEM, e.g., a physics workshop included activities on laser radio, colour and photonics, LEGO physics using racing cars and building solar-powered mini racing cars.

The Design and Technology Enrichment Series is a four-part experience, where workshops focused on design and technology, robotics and coding throughout the academic year. The same students attend all workshops, gradually building their STEM skills over the year.

Our three-day intensive conference builds STEM skills through hands-on activities. In a first for SA, 141 Year 9 girls participated in the conference in 2019, which featured a three-day schedule of 45 sessions including hands-on workshops, tours, industry talks, teacher professional development, and round-table discussions aimed at inspiring girls



towards STEM. We've hosted students from regional areas including Whyalla and Kadina.

These programs involve the input of many high-profile STEM experts, academics and industry leaders, together with inspiring early-stage researchers who are committed to motivating others.

When we commenced the first STEM Enrichment Academy in 2018, our target was to attract 120 students. Now we've held three, engaging 451 girls and 55 teachers at no cost to the schools or participants.

We know these activities have been successful. Our research indicates students' attitudes on the difficulty of STEM careers are reversed through the programs, with a clear majority shift in girls' attitudes towards considering careers in science from 'No' to 'Yes'.

The thing is, girls (and boys), can think science is challenging without giving it a proper go. Without delving into practical science and hearing from role models working in STEM fields they love, they can't see how fascinating it is and make that connection to real world outcomes.

There are limits on undertaking these activities at school, as the curriculum covers a large spectrum and resources are finite, so if we want more girls to consider STEM, we need to create positive interventions that enrich and empower our kids.

The next STEM Enrichment Conference will be held from 17 to 19 February 2021.

For details visit: <https://www.flinders.edu.au/study/schools-teachers/stem-enrichment-academy>

Maria Parappilly has received multiple honours for services to STEM education and women including a Medal of Order of Australia (2020), The 2019 Advertiser Woman of the year - Top Innovator: AIP Education Medal (2018), D2L Innovation in Physics Award (Canada 2017); South Australian Women's Honour Roll (2017) and SA STEM Educator of the year (2015).

Kangaroo Island: A Community approach to Earth & Environmental Science Education

In South Australia we are blessed with an abundance of sites to visit and ideas to contemplate when pondering involving students in environmental field work. However, developing meaningful connections with a place is the difficult part as connections require the involvement of community - people who can interpret the environment and issues for us. Kangaroo Island has a wealth of environmental resources as well as people to call upon. Here Bec Vogt gives an overview of KICE's Earth and Environmental Science Program and how it calls upon community involvement.

Bec Vogt, Kangaroo Island Community Education (KICE)

The Year 11/12 Earth and Environmental Science (EES) Program has been designed to involve the Kangaroo Island community as much as possible. In the past two years it has utilised many community links both in the classroom and out in the field. Following is an overview of some of the community-based projects students have been involved with.

Cambrian Geology at Emu Bay with the University of Adelaide

Emu Bay, located a short drive from Kingscote, contains evidence of the explosion of the diversity of life that came with the Cambrian explosion. Associate Professor Diego Garcia-Bellido, from the

University of Adelaide was our guide as students undertook palaeontology activities at the Fossil Pit, Emu Bay.

Water Quality Studies with the Landscapes Board

The Cygnet River is the longest river on Kangaroo Island. Our students worked together with Mark Agnew (was NRM now the Landscapes Board) to determine the water quality of the Cygnet River Catchment. The students collected data and replicated the initial project the board did called "Coast to Catchment". Students were given access to data from the project and were able to analyse the raw data and apply it to concepts taught during class.



Year 11/12 Earth and Environmental Science students at the Fossil Pit, Emu Bay

Goanna Research with Dr Peggy Rismiller

Dr Peggy Rismiller from the Pelican Lagoon Research Centre came to speak to our students about the Rosenberg Goanna, an endangered species. Then students were involved in data collection measuring termite mounds. The GPS coordinates and measurements the students made were used in Peggy's Research. They also took part in the Goanna Watch project collecting data from the roads. More information can be found here: https://landscape.sa.gov.au/ki/plants-and-animals/native-animals/rosenbergs_goanna

Environmental Science Camp with KI Land for Wildlife

This year the Year 11/12 classes from Earth and Environmental Science, Biology and Outdoor Education combined for a 3-day camp down the Western End of Kangaroo Island. The camp was run by Kangaroo Island Land for Wildlife (<https://www.acnc.gov.au/charity/4d038c14e529b62ba7a130c9efbd7a35>). KI Land for Wildlife work with landholders to protect and conserve threatened species on KI. This camp was specifically looking at the Dunnart (a threatened species on Kangaroo Island that has lost 95% of its habitat due to the recent bushfires); ways to conserve the species; and ways to reduce threats (both plants and animals).

Touring significant sites with National Parks and Wildlife

Students have also been involved in a number of educational tours from the National Parks and Wildlife. In 2019 they were able to go to Kelly Hill Caves (unfortunately not an option in 2020) and this year they were able to go to Seal Bay Conservation Park to learn about the endangered species the Australian Sea Lion.

Soil and Land Management studies with PIRSA

Both Kingscote and Parndana Campus have also had the opportunity to work with Lyn Dohle (Senior Consultant for Soil and Land Management from PIRSA). Lyn is a STEM Professional who is

eager to use her knowledge about soils and land management to teach students about better ways to manage soils. She has worked with the EES students at Kingscote specifically looking at dry land salinity and how we can better manage our soils and has also worked at Parndana Campus with the Agriculture students to determine soil health (pH, Nitrates, Phosphorus) as well as fencing strategies to ensure vegetation can recover.

Agriculture Science studies with Primary Producers

Agriculture Science students have also had community members speak to the students regarding sheep management, shearing techniques, native plant species and fencing techniques. These were local farmers/stock agents who volunteered their time.

Citizen Science involvement with Dolphin Watch

Kingscote students have also been involved in the Dolphin Watch Program, they have had guest speakers talk to the students about the importance of the Community Science Project and then students were given the wonderful opportunity to collect data by taking photographs and identify Dolphins. This occurred both across the Middle Years and Senior Years at Kingscote. Visit: <https://kangarooislanddolphinwatch.com.au/>



Year 11 student helping to make bucket traps on the KILFW Camp

If you are planning to take students on a science-focused field trip to Kangaroo Island, KICE science staff suggest contacting Kangaroo Island Land for Wildlife. Visit their Facebook page at: www.facebook.com/KILandforWildlife

Science Education on Kangaroo Island



Kangaroo Island is a beautiful place with a rich natural environment and a strong community identity. It is a South Australian treasure. In this article we find out what it is like to teach science on Kangaroo Island; and gain some sense of what it might be like to be a science student there. This year student projects from Kangaroo Island were entered into the Oliphant Science Awards. Images of some of their prize-winning projects illustrate the article.

Rachel Pillar, Kangaroo Island Community Education (KICE)

Kangaroo Island Community Education (KICE) is a public school spread over three campus' – Penneshaw (R-9) located nearest the eastern end of the Island; Parndana (P-12) in the agricultural centre; and Kingscote (10-12) on the northern coast at Nepean Bay. The school has many moving parts with around 700 students drawn from all parts of the Island. The Parndana Campus has an aquaculture system in which Barramundi are farmed. Also, a 10 hectare farm that permits a program that includes animal husbandry, cropping, apiary and horticulture.

The KICE science program tends to have a campus-specific focus that leverages off the unique resources and environments that are readily available - the agricultural and aquaculture facilities at Parndana; connections to the Kangaroo Island Landscape Board at Kingscote; and the fascinating geological features and marine environment at Penneshaw.

KICE is a small school and vertically grouped classes are common. The constantly changing composition of science classes at KICE means that no two years are the same. For example, James Cooper at Penneshaw is currently teaching three different year levels in the one class. I am currently teaching a Year 8/9 science class; as well as a vertically grouped Year 11/12 Chemistry class.

These groupings regularly change depending on a whole variety of factors, including student numbers, which keeps us on our toes and requires us to come up with new and creative ideas for integrating different aspects of the curriculum. The downside is that it is difficult for us to have a single 'KICE-wide' science curriculum that can be taught across all three campuses because the class groupings are different.

What are the strengths of science teaching on Kangaroo Island?

Our community connections are strong; field work with external groups and organisations is a strong part of science education at KICE and this tends to change and adapt in line with current areas of research and funding, as well as staff connections and expertise. Examples of past programs include working at Seal Bay, seagrass planting for ecosystems, and the Dunnart program with Kangaroo Island Land for Wildlife (see previous article).



Olivia Stewart, Mia Krause & Alyssa Smart
Kangaroo Island Community Education
Oliphant Science Awards Category: Games
Project Title: Save a Hoodie
3rd Place Year 9-10

Many of our parents work in fields that are connected to the curriculum and this provides us with wonderful opportunities for guest speakers and excursions.

An additional strength of teaching on KI is the small class sizes and knowing our students well. We often find ourselves teaching our own children, each other's children or the children of friends we've known for years. It creates strong teacher-student relationships and a sense of trust within our classrooms and I think it pays off for our students in terms of wellbeing and their sense of confidence as learners. They know they can talk to us about anything and they know they'll have the extra support whenever they need it.

We have such easy access to a wide variety of locations for field trips. Some of my best excursions have been within walking distance from the school (coastal walks around Kingscote, the quarry at Reeves Point).

It's relatively easy for us to get our students outside of the classroom because we have lots of support from people in our community (e.g. landowners, experts) and our smaller class sizes makes supervision easier.

Yet another strength of working on KI is the peer support and opportunities for collaboration – I'm currently organising an excursion for the entire Year 8/9 science cohort at Kingscote in collaboration with James Cooper (Year 8 Science teacher), Paull Marlow (Year 9 science teacher), and Evan Maywald (Year 9 HASS teacher). Our excursion will cover biomes (HASS curriculum) and ecosystems (Science curriculum) and we will be helping Kangaroo Island Land for Wildlife install two survey sites on a private property 25 mins from Kingscote to monitor species biodiversity and abundance (particularly Kangaroo Island dunnarts and feral cats).

What are the challenges of teaching science on Kangaroo Island?

There is a sense of professional isolation, particularly for senior years teachers – there are not many of us and there is no other 'specialist physics teacher' to go talk to, so we have to be more self-reliant and support each other. This makes it harder for us to moderate and given that our classes are small, we have to be vigilant in ensuring our assessment judgements are accurate.

Thank you to the science staff at Kangaroo Island Community Education for their assistance with this article.



The Parndana township experienced significant bushfire damage and so a focus in Science this year has been to study the Science of bushfires. The year 7/8 class entered posters in the Oliphant Science Awards.



Grace Morgan

Kangaroo Island Community Education
Category: Posters – The Science of Bushfires
Project Title: Fire-fuelled thunderstorm clouds
3rd Place Year 7-8

It is also harder to access face-to-face training and development – just like any regional area. Interestingly we have all been in the same boat this year with the rise of online meeting platforms!

There have been long-lasting impacts to staff and student wellbeing from the bushfires, and this has been compounded by COVID-19. I've definitely noticed the impact these events have had on my students this year, it's been unlike any other. However, it's also brought out the best in people – people at our school are incredibly empathetic and flexible.

“Have fun and try not to disturb the wildlife”

This year Callum Klein from Kangaroo Island received the **Rowe Scientific Country Secondary School Prize** for his entry in the photography category. Meanwhile, the last edition of this Journal (Number 1, 2020) featured a photograph by brother Bryson Klein on the front cover. Family shared interest in science is so often evidenced in Oliphant Science Award entries. We caught up with parents Corinna and Heiri Klein to ask about the brothers' shared interest in nature photography and asked Callum for some photography tips. Corinna is an educator at KICE and Heiri an ecologist with Landscape SA.

How did Callum and Bryson's interest in photography develop?

As could be expected from a teacher, Corinna has always been very engaged in our boys' education and I (Heiri) share that attitude. We have always been avid travellers and interested in nature, be it our own 'backyard' or far-away places such as some of the remote regions of Madagascar, the Amazon or Bolivian highlands. Without having to try hard we share this passion with our kids.

The boys have an inquisitive nature; a love for nature and the outdoors; and also love taking photos, without thinking much about "photography" as such. They both got their first little cameras at the age of about six and were always allowed to use our cameras as well. We are lucky to have our own bush block on KI, which we use for camping, hikes and outdoor cooking.



Callum, Heiri, Corinna & Bryson Klein,
Wilpena Pound



Photographer: Callum Klein
Kangaroo Island Community Education
Topic: Biodiversity of Wetlands
1st Place Year 7-8

Oliphant Coordinator: Rachel Pillar

Callum's suggestions for aspiring nature photographers:

- Take lots of photos and from different angles
- Be quiet. Be patient
- Light - it is good to have the sun behind you
- Take photos at different times of the day. The morning and early evening are a good time to take photos of birds
- Distance - start taking photos from further away and slowly get closer. That way you get a photo just in case you scare the bird or animal away
- Timing - sometimes take lots of photos quickly
- Have fun
- Try not to disturb the wildlife.

Oliphant Science Awards: Prize winners

Oliphant Trophy Winner 2020

For outstanding science content.

11-12 Raihanah Pranggono, Glenunga International High School
Scientific Inquiry: Investigating the Effects of Disaccharides and Monosaccharides on the Rate of Respiration in *Saccharomyces cerevisiae*

Oliphant Medal

Presented to the 2019 Oliphant Trophy Winner
6–7 Phoebe Wood, Upper Sturt Primary School
Models & Inventions: *Anchiornis Huxleyi*

Category Prizes R–6

Computer Programming & Robotics

Reception – Year 2

1st
Nivaan Sardana
St Peter's College
Innovative Lego Robotics Model

2nd
Eric Wang
St Peter's College
Mindstorms

3rd
Lachlan Everett
Annesley Junior School
Blinky the Teeth Cleaning Robot

Year 3–4

1st
Jackson Burford
St John's Grammar School -
Hidden Waves - Doppler Shift Simulator

2nd
Amelia Cavagnaro
Rose Park Primary School
A-BOT to the rescue

3rd
Siddharth Prabhu,
Anas Qureshi
Rose Park Primary School
SAN the Chatbot

Year 5–6

1st
Rashmi Adiga
Mawson Lakes School
Solar System Simulation

2nd
Blake Hoendervanger
St Thomas School
Robotic Hand

3rd
Carter Camilleri,
Sethania Jimenea
St Augustine's Parish School
Waste

3rd
Sien Mitchell
Colonel Light Gardens Primary School
Earthquake Alert

Crystal Investigation

Reception – Year 2

1st
Isaac Powell
Grange Primary School
Crystal Investigation

3rd
Ilona Danilovic,
Thaarani Muthukarthikeyan
Immanuel Primary School
Incredible Crystal Collection

Year 3–4

1st
Chloe Lambden
Walkerville Primary School
Crystals: Is one better than two?

2nd
Odin Swan, Louie Cook
Grange Primary School
Crystal Investigation

3rd
Mikayla Berry-Smith
Grange Primary School
Crystal Investigation

Year 5–6

1st
Aazeen Haider
Mawson Lakes School
Crystal Investigation

2nd
Jack Theakstone
Annesley Junior School
Operation Nucleation

Games

Reception – Year 2

1st
Samuel Canning
Immanuel Primary School
Buzzing Fun

2nd
Zoe Dowdall
Grange Primary School
Space aboard game

3rd
Lila Nassery, Adeline Wilson
Wilderness School
Guess-o-saur

Year 3–4

1st
Alexander Smith
St Andrew's School
The Journey of Photosynthesis

2nd
Willem Schinckel,
Harrison McCall
St John's Grammar School
The Race Around Space

3rd
Madeline Redshaw,
Jessica Helmling
Immanuel Primary School
Save the Animals game

Year 5–6

1st
Kara Heidrich
Annesley Junior School
How to build a human body

2nd
Isla Church
Brighton Primary School
Frog Frenzy

3rd
Nainika Vemulapalli,
Sara Shafeeu
Bellevue Heights Primary School
Environmental Trivia

Year 3–4

1st
Ilan Storer
St Andrew's School
COVID 19 Anatomy of a killer virus

2nd
Prisha Jaiswal
Richmond Primary School
Hydraulic lift

2nd
William Chen, Jacob Wong
Highgate School
Future Tower

Year 5–6

1st
Eugene Lee
Pedare Christian College
Dye Sensitised Solar Cells

2nd
Shaya Ismail
Norwood Primary School
Hey Al, what's this fruit?

3rd
Aislinn Lauder
Woomera Area School
The Evolution of the Horse

Multimedia

Reception – Year 2

1st
Patrik Porter
Coromandel Valley Primary School
The Science of Skiing

2nd
Mihika Gorey
Grange Primary School
The Science of Dalgona Coffee

3rd
Charlotte Atkinson
Virginia Primary School
Movement Magic

Year 3–4

1st
Jasmine Helwig
Highgate School
Water Cycle

2nd
Ethan Wass
Coromandel Valley Primary School
Mars

3rd
Abigail Atkinson
Virginia Primary School
Rat Race - The Movie

Year 5–6

1st
Priyanka Thavarajah
Seymour College
What makes cakes fluffy?

1st
Scarlett Fisher
Aldgate Primary School
Bioluminescence

Photography

Reception – Year 2

1st
Zachary Summerton
Crafers Primary School
Sports Science

2nd
Alice Schammer
Hawthorndene Primary School
New life

3rd
Isaac Powell
Grange Primary School
Science of Celebrations

3–4
1st
Joshua Clothier
Immanuel Primary School
New Life

2nd
Sullivan Koenig
Vale Park Primary School
Sports Science

3rd
Bonnie Cabot
St Andrew's School
Camouflage

Year 5–6
1st
Violet Newell
Salisbury Park Primary School
Life in the Wetlands

2nd
Caitie Wroniak
Vale Park Primary School
New Life

3rd
Mia Luppino
Loreto College
New Life

Posters

Reception – Year 2

1st
Joshua Low
Immanuel Primary School
The Science of Bushfires

2nd
Angus Christo
Rose Park Primary School
The Science of Bushfires

3rd
Maryam Cedra Sawad
Wilderness School
The Science of Bushfires

3rd
Mihika Gorey
Grange Primary School
The Science of Bushfires

Year 3–4
1st
Kishan Saha
Scotch College
Natural History Illustration

2nd
Jasmine Morris
Bellevue Heights Primary
School
Forces in Children's Toys

3rd
Connor Wallace
Scotch College
The Science of Bushfires

Year 5–6
1st
Isabella Spagnoletti
Loreto College
The Science of Bushfires

2nd
Kayla Talbot
St Thomas School
Bush Foods

3rd
Annika Ganesh
Wilderness School
Forces in Children's Toys

Science Writing

Reception – Year 2

1st
Ivan Leong
St Andrew's School
*Climate Change; The Way
Forward?*

2nd
Anna Luo
St Andrew's School
Living on Mars

3rd
Jack Williams
Immanuel Primary School
Hidden Waves

Year 3–4
1st
Chloe Lambden
Walkerville Primary School
*Shirley the Short-Tailed
Shearwater and the Polluted
Ocean*

2nd
Connor Wallace
Scotch College
Hidden Waves

3rd
Venuki Venara Kodithuwakku
Arachchige
Mawson Lakes School
*Climate Change; The Way
Forward?*

Year 5–6
1st
Krishna Neelam
Mawson Lakes School
*Climate Change; The Way
Forward?*

2nd
Samarbir Singh
St Andrew's School
Living on Mars

3rd
Kara Heidrich
Annesley Junior School
*Climate Change; The Way
Forward?*

Scientific Inquiry

Reception – Year 2

1st
Hamish Butfield
Norwood Primary School
*What do other people feel
about the Coronavirus?*

2nd
Liam Hooper
Immanuel Primary School
Understanding Beyblades

3rd
Charlotte Atkinson
Virginia Primary School
*Does exercise make my body
warm up?*

Year 3–4
1st
Arjun Betti
Norwood Primary School
*Can you grow plants using
recycled water from washing
machines?*

2nd
Abigail Atkinson
Virginia Primary School
Rat Race - The Investigation

3rd
Connor Wallace
Scotch College
Helping Our Creek

Year 5–6
1st
Eugene Lee
Pedare Christian College
*Dye Sensitised Solar Cell
(DSSC)*

2nd
Priyanka Thavarajah
Seymour College
*Does increasing the
concentration of Carbon
Dioxide in the Atmosphere
cause it to warm?*

3rd
Cristina Parletto
Walford Anglican School for
Girls
*The effect of nuclear radiation
on plant growth*

Silver Sponsor Prizes R–6

Australian Institute of Energy Prizes R–6

*Awarded to the best entry
at each year level with a
sustainable generation and
uses of energy theme.*

R–2 Jack Williams, Immanuel
Primary School
Models & Inventions:
*Sustainable House
Model*

3–4 William Chen & Jacob
Wong, Highgate School
Models & Inventions:
Future Tower

5–6 Eugene Lee, Pedare

Christian College
Models & Inventions:
*Dye Sensitised Solar
Cells*

Catholic Education SA Primary School Prizes

*Awarded to the best two
primary schools with high
achievement and participation
across a wide range of
categories.*

1st Immanuel Primary
School
2nd St Andrew's School

CSIRO Education/ CREST Primary Prize

*Award for consistently high
achievement and participation
in the Scientific Inquiry and
Models and Inventions
categories.*

Best non-CREST School:
Seymour College

Best CREST School: Norwood
Primary School

University of South Australia - Sustainable Future Prize R–6

*Awarded to the most
inspiring entry highlighting
the value of Information
Technology, Engineering and
Environmental Science to a
Sustainable Future.*

3–4 Arjun Betti, Norwood
Primary School
Scientific Inquiry: *Can
you grow plants using
recycled water from
washing machines?*

Platinum Sponsor Prizes R–6

Department for Education Young Scientist Awards R–6

1st Chloe Lambden,
Walkerville Primary
School
Eugene Lee, Pedare
Christian College

2nd Priyanka Thavarajah,
Seymour College
Krishna Neelam,
Mawson Lakes School

3rd Kara Heidrich, Annesley
Junior School
Isaac Powell, Grange
Primary School

Category Prizes 7–12

With thanks to Rowe Scientific for sponsoring all of this year's 7–12 Awards.

Computer Programming & Robotics

Year 7–8

1st
Sam Weavers
Adelaide Botanic High School
A Day in the Life of a Virus

2nd
Luke Mulders
Concordia College
Simulating Ecosystems

3rd
Joshua Cartledge
Glenunga International High School
Rainwater Tank Monitor (RTM)

Year 9–10

1st
Lachlan Miegel, Blake Tourneur
St John's Grammar School
HydroSoil: Smart Irrigation Solutions

2nd
Paul Cyril, Lachlan Blake
The Heights School
An Arduino based turbidity monitor for water quality monitoring

3rd
Sophie Wegener
Glenunga International High School
Dichotomous-key classification game

Crystal Investigation

Year 9–10

1st
Iknoor Khurana
Brighton Secondary School
Crystal Investigation

Games

Year 7–8

1st
Hafsa Khan
Mitcham Girls High School
Zoodo

2nd
Brooke O'Dwyer
Mitcham Girls High School
Circuit Masters

3rd
Lily Gao, Max Lock,
Aaron Walsh
Highgate School
To Catch a Cuckoo

Year 9–10

1st
Stuart Vass
Pembroke School
S.C.I.E.N.C.E.

1st
Lachlan Billing, Leander George, Finlay Bowens Brighton Secondary School
Space Race

3rd
Olivia Stewart, Mia Krause, Alyssa Smart
Kangaroo Island Community Education
Save a Hoodie

Year 11–12

1st
Hattie Nguyen
Brighton Secondary School
Star Life Cycle

2nd
Taya Lewis, Chloe Baines
Salisbury High School
Science or Shame: The Ultimate Science Board Game

Models & Inventions

Year 7–8

1st
Zeina Aljawhari
Walford Anglican School for Girls
Solarspy, Solar Tracking Prototype

2nd
Johanna Webb
Walford Anglican School for Girls
Tensegrity - Lego

3rd
Winston Telfer
Lower Eyre Peninsula Home School Group
The Not-so-simple (Ball) Machine

Year 9–10

1st
Regan Nelson
Prince Alfred College
The Skyhook Propulsion System (TSPS)

2nd
Leah Hall
Brighton Secondary School
Darwin's Evolutionary Model

3rd
Rowan Barnett
St John's Grammar School
Why do flowers and plants close overnight?

Multimedia

Year 7–8

1st
Gabrielle Yoong, Kasia Klar, Alana Kneebone
Walford Anglican School for Girls
Viruses

2nd
Lucy Rice
Walford Anglican School for Girls
Save the Bees - Addressing Declining Bee Populations

3rd
Johanna Manlapas
Glenunga International High School
The Pendulum

Johanna Manlapas is also recipient of the Australian Institute of Physics (AIP) Prize for the most outstanding entry with a physics theme.

Year 9–10

1st
Asira Suetrong
Glenunga International High School
The Endocrine System

2nd
Beth Worthley
Walford Anglican School for Girls
What is a non-Newtonian fluid?

3rd
Deamanthe Kassapis
Walford Anglican School for Girls
The development of a child in a womb

Year 11–12

1st
Josephine Oehler
Seymour College
Water in a Glass Test Tube - Adhesive vs Cohesive Forces

Photography

Year 7–8

1st
Callum Klein
Kangaroo Island Community Education
Life in the Wetlands

2nd
Summer Winwood
Concordia College
New Life

3rd
Coco Nelson
Mitcham Girls High School
Camouflage

Year 9–10

1st
Kasimir Kellermann Williams
Glenunga International High School
Camouflage

2nd
Caitlin Wood
Eynesbury Senior College
Life in the Wetlands

3rd
Savin Dissanayake
Glenunga International High School
Life in the Wetlands

Year 11–12

1st
Syme Aftab
Glenunga International High School
Life in the Wetlands

2nd
Isabelle Lilburn
Loreto College
Sports Science

3rd
Akshara Radhakrishnan, Anika Younus
Glenunga International High School
Life in the Wetlands

Posters

Year 7–8

1st
Phoebe Wood
Aldgate Primary School
Natural History Illustration

2nd
Sarah Honter
Mitcham Girls High School
A Satellite Zoo

3rd
Grace Morgan
Kangaroo Island Community Education
The Science of Bushfires

Year 9–10

1st
Yastika Choure
Brighton Secondary School
The Science of Bushfires

2nd
Tahlia Keegan
St John's Grammar School
The Science of Bushfires

3rd
Jess Williams
St John's Grammar School - Senior School
Forces in Children's Toys

Year 11–12

1st
Isabelle Lilburn
Loreto College
Natural History Illustration

2nd
Madeleine Flapper
Loreto College
Miniature World

3rd
Josephine Oehler
Seymour College
Miniature World

Science Writing

Year 7–8

1st
Twisha Srivastava
Glenunga International High School
Living on Mars

2nd
Dewwandi Wijekoon
Glenunga International High School
Deep Blue: Innovations for the Future of our Oceans

3rd
Niya Singhal
Wilderness School
Living on Mars

Year 9–10

1st

Matthew Lim
Pembroke School
Hidden Waves

2nd

Chengcheng Zheng
Wilderness School
Does Radiation Make Superheroes?

3rd

Vanessa Rapuano
Mary MacKillop College
Climate Change; The Way Forward?

Year 11–12

1st

Sarah Edwards
Eynesbury Senior College
The Communication, Collaboration and Scientific Development of the CERN Large Hadron Collider

1st

Ashlee Fauser
Mitcham Girls High School
The Grey Wolf

3rd

Fai Chan
Wilderness School
Does Radiation Make Superheroes?

Scientific Inquiry

Year 7–8

1st

Sienna Hill
Our Lady of the Sacred Heart College
Starch Hydrolysis by Amylase and Detergent

Sienna Hill is also the recipient of the Australian Society for Biochemistry and Molecular Biology Prize for the most outstanding entry with a biochemistry or molecular biology theme.

2nd

Emily Estcourt Hughes
Walford Anglican School for Girls
Mining water on Mars for sustainable human colonisation

3rd

Shanza Ismail
Norwood Primary School
The Quality of Drinking Water in South Australian Public Playgrounds

Year 9–10

1st

Prathicksha Venkatesan
Walford Anglican School for Girls
The Effect of Curcumin and Bacteriophage on Multi-Drug Resistant Bacteria

2nd

Inika Weber, Trishna Ramkumar
Wilderness School
What is the best germination method for senecio macrocarpus

3rd

Sohana Pasula
Emmaus Christian College
To investigate the effect different dish soaps and fruits have on the extraction of DNA

Year 11–12

1st

Raihanah Pranggono
Glenunga International High School
Investigating the Effects of Disaccharides and Monosaccharides on the Rate of Respiration in Saccharomyces cerevisiae
Raihanah Pranggono is also the recipient of the Royal Australian Chemical Institute (RACI) Prize for the most outstanding entry with a chemistry theme.

2nd

Yu (Amy) Shi
Glenunga International High School
Particulate black carbon and its contribution to the urban heat island effect

3rd

Isabelle Lilburn
Loreto College
Is the central route of persuasion more effective at changing an individual's attitude towards tobacco than the persuasive route?

Silver Sponsor Prizes 7–12

Australian Institute of Energy Prizes 7–12

Awarded to the best entry at each year level with a sustainable generation and uses of energy theme.

7–8 Zeina Aljawhari, Walford Anglican School for Girls
Models & Inventions:
Solarspy, Solar Tracking Prototype

9–10 Matthew Lim, Pembroke School
Science Writing: Hidden Waves

CSIRO Education / CREST Secondary Prize

Award for consistently high achievement and participation in the Scientific Inquiry and Models and Inventions categories.

Best non-CREST school:
Walford Anglican School for Girls

Best CREST School: Brighton Secondary School

Flinders University Environment Prize

7–12

Awarded to the most inspiring entry covering an environmental issue in South Australia.

11–12 Yu (Amy) Shi, Glenunga International High School
Scientific Inquiry:
Particulate black carbon and its contribution to the urban heat island effect

Flinders University Science Prize 7–12

Awarded to the outstanding research-based entry in science.

9–10 Prathicksha Venkatesan, Walford Anglican School for Girls
Scientific Inquiry: The Effect of Curcumin and Bacteriophage on Multi-Drug Resistant Bacteria

The University of Adelaide, Faculty of Engineering, Computer & Mathematical Sciences Prize

Awarded to the most outstanding entry with an engineering, mathematical or engineering theme.

9–10 Regan Nelson, Prince Alfred College
Models & Inventions:
The Skyhook Propulsion System (TSPS)

The University of Adelaide, Faculty of Sciences Prize

Awarded to the most outstanding entry highlighting the benefits of scientific research to the community.

9–10 Chengcheng Zheng, Wilderness School
Science Writing:
Does Radiation make superheroes?

Gold Sponsor Prize

Defence Science & Technology's Secondary School Prizes

Year 7–10

1st Walford Anglican School for Girls
2nd Glenunga International High School

Year 11–12

1st Glenunga International High School
2nd Loreto College

Platinum Sponsor Prizes

Rowe Scientific New/Country Secondary School Prize

Awarded to the best student entry from a new/country school.

7–8 Callum Klein, Kangaroo Island Community Education
Photography: Life in the Wetlands
7–8 Sam Weavers, Adelaide Botanic High School
Computer Programming, Apps & Robotics: A Day in the Life of a Virus

Department for Education Young Scientist Awards 7–12

Young Scientist Awards 7–12

1st	Isabelle Lilburn, Loreto College Regan Nelson, Prince Alfred College
2nd	Josephine Oehler, Seymour College Lachlan Miegel, St John's Grammar School Blake Tourneur, St John's Grammar School
3rd	Raihanah Pranggono, Glenunga International High School Sam Weavers, Adelaide Botanic High School

The story of an Oliphant Trophy Winner

Phoebe's *Anchiornis huxleyi* journey

Last year Phoebe Wood won the Oliphant Trophy - the grand prize of the Oliphant Science Awards - for her model of a paravian dinosaur, *Anchiornis huxleyi*. That was the first occasion the Trophy had ever been won by a primary-aged student. It took Phoebe over 400 hours of work to produce the model which was subsequently declared by Hong Kong University Professor Michael Pittman as the world's most accurate model of the animal to date.

Since receiving the trophy, Phoebe and her family have had a very eventful time! In this article Phoebe's mother, Jo Wood, describes events as they unfolded – from hatching of the first idea through to the present time.

"I am going to make a model!"

In December 2018, our 11 year-old daughter, Phoebe, declared she was going to make a life sized model of a feathered dinosaur for the following year's Oliphant Science Awards.

At the time, Phoebe had a bird fascination that had evolved into a wonder about the evolution of flight. She had recently been given a book for her 11th birthday - the Field Guide to Mesozoic Birds. By this time she was already a practiced and successful Oliphant Science Awards entrant. Each December we would watch the OSA website eagerly awaiting the announcement of the following year's categories. I would encourage our two daughters to start projects early and finish early. The early finishes never happened, but I would still try!



Months of focused research and model making

By January 2019 Phoebe had decided on *Anchiornis huxleyi* as her chosen paravian (pre-bird) dinosaur. She knew what the size limitations were for the Models and Inventions category so chose her animal accordingly. Fortunately, there was a lot of relatively recent information about the discovery of the colours that *Anchiornis* was and the use of new laser-stimulated fluorescence (LSF) imaging to determine the body shape of a fossilised animal, effectively putting flesh on the bones.

In the months that followed Phoebe read and noted scientific papers; explored material options for her

model with many failures and false starts; and even wrote to Academics abroad for additional details.

Phoebe wins the Oliphant Trophy

Fast forward several months to the Oliphant Science Awards Open Day where Phoebe's model (pictured) was displayed.

Professor Flint (Michael Mills) was Master of Ceremonies for the occasion. Known as the singing palaeontologist he was excited about Phoebe's model and by the time we spoke to him he had already sent photos of the model to his friends in the SA Museum and Flinders University Palaeontology Laboratory.

On the same day, David Riley from Makerspace Adelaide offered Phoebe free access for the next year because he wanted to see what else she was capable of. Phoebe also had the chance to meet Ms Monica Oliphant, daughter-in-law of OSA's patron, Sir Mark Oliphant, and well renowned solar scientist in her own right. She is such a charming woman and spoke at length with Phoebe about her project.



Phoebe was presented with the Oliphant Trophy for her winning model at the Presentation Ceremony on 20 September 2019.

Media Interviews and podcasts with Scotty on display at the Museum

Following the award ceremony Phoebe was swept up in a whirlwind of activity.

Here are some highlights:

- Phoebe was interviewed by **The Advertiser**.

- She was invited to the **Flinders University Palaeontology Laboratory** where she met the professors, graduates, PhD students, palaeoartists and fossil preparators. Phoebe was treated with great respect and nobody



spoke down to her because of her young age, rather there was an element of awe that one so young could produce this incredible model.

- A visit to the **SA Museum** where she met Associate Professor Diego Garcia-Bellido and where Scotty (as Phoebe affectionately named her model after palaeoartist Scott Hartmann from Wisconsin University) would be put on display in the Discovery Centre for the next 3 months. This was the first time the SA Museum has displayed someone's private work.
- Phoebe spoke at the Oliphant Science Awards presentation night for a full 5 minutes and pulled off her speech with grace and eloquence.
- Phoebe did a podcast interview in the SA Museum for Steve Davis' Adelaide Podcast. The interview was to done by Steve's dinosaur loving daughter, AJ, who was also 11 years old. The girls became instant firm friends which made the interview flow beautifully.
- The story about Phoebe's win and the potential of children to do amazing things with the support of the adults in their lives was published in Yomiuri newspaper in Nagoya, Japan.

Now to a Global Palaeontology Conference in Brisbane

While visiting Flinders University we were told of an upcoming Society of Vertebrate Palaeontology (SVP) Conference to be held in Brisbane. This was the first time this conference was to be held in the Southern Hemisphere.

I had been trying to contact the convenors of the SVP conference to see if we could attend. Not being palaeontology students, just a mum and child, there were no ticketing options for us. As I hadn't heard back from them, we decided we'd go on a family road trip and visit the Naracoorte Caves to give the children a bit more of a prehistoric creature fix. On exiting the Victoria Cave, I checked my email

and found that Professor John Long from Flinders University Palaeontology Lab had very kindly donated a spare ticket so that we could attend. It was starting in two days! We made a mad dash home while I googled flights and accommodation for the next day to Brisbane.

Phoebe and I flew to Brisbane in time for the first day of the SVP Conference. It was nothing short of a phenomenal experience. We attended many presentations over the four days there. On the first day Phoebe was absolutely thrilled to meet her two heroes who had done the original research on the *Anchiornis huxleyi*, Professor Michael Pittman from Hong Kong University and Dr Scott Hartmann, palaeoartist and anatomy lecturer from Wisconsin University. Phoebe became a minor celebrity at the conference!

At the welcome party held in Queensland Museum, she was introduced to the royalty of global palaeontology. She met the curator of the Smithsonian Museum in California, the curator of the Australian Museum, the world's leading avian palaeontologists and the lead PhD student studying *Anchiornis huxleyi*.

She was invited to dinner and the pub by a group of incredible palaeoartists from around the world, two of whom went on to win the top two coveted art prizes of the conference. People were approaching us many times a day to speak to Phoebe – who had been jettisoned into a star-like status there! Even the security guards were calling her The Littlest Palaeontologist.

While there she was asked to do a podcast interview for the highly regarded US podcast *I Know Dino*. She was offered a job sculpting life size replicas of endangered native species. She still intends taking the former preparator from Qld Museum up on the offer at some point. She carried her folder of photographs and all the research papers she had used with her everywhere and everyone was genuinely interested to see what she had done and talk with her. On the second day there she looked at me with a blissful expression on her face and said, "Oh Mum, I've finally met my people."

On the third evening they held a silent auction. One of the items was a selection of books, including the *Manual of Ornithology*, which Phoebe desperately wanted. She wrote down her bid of \$36, all the money she had. Then someone outbid her. One of the palaeoartists from the USA saw it & put in a much higher bid, then stood over the book



Meeting Prof Michael Pittman and Dr Scott Hartmann. "Scotty" had been named after Dr Hartmann

and loudly proclaimed that nobody was to “outbid the kid”. She won the items and gave the book to Phoebe who insisted that she sign it for her. Then before we knew it there was a line up of the worlds top avian palaeontologists all signing the book for her, writing encouraging messages and drawing pictures in it. It was astounding and so very heartwarming. 37 people signed it for her. It's her most prized possession now, aside from Scotty himself and the Oliphant Trophy which she's recently handed back.

Within a couple of days of coming home from Brisbane, Phoebe completed her entry to the BHP Billiton awards for her model. All winners of the Models and Inventions category gain entry into these further awards. Being more focussed on the engineering side of things, her model did not gain a placement.

Since then she has been featured in the winter edition of the Prehistoric Times Magazine in the USA, the January 2020 edition of Flinders University Palaeontology Society gazette, Beer n Bones. We have visited Makerspace Adelaide, where Phoebe and a friend laser cut wings for their 2020 OSA entry of a meganeura – a prehistoric dragonfly-like giant insect and Scotty was put on display in the Stirling library in the Adelaide Hills for a couple of weeks to encourage local hills children to enter the awards this year.

On the 6th of April 2020 Phoebe was Zoom interviewed as part of a pilot program for *Earth Visual and Physical Inc's Dinosaur Zoo*. Due to COVID-19, these giant puppet shows featuring huge realistic dinosaurs, had all of their global tours cancelled. They were to be showing in Japan and across the USA 2020-21. Instead they turned it into *Dinosaur Zoom*, and the pilot program was accepted for full video production for the Japanese leg of the tour. It's possible Phoebe will be called upon again

Caitlin Wood, Phoebe's sister, is also a regular entrant in the Oliphant Science Awards. In 2016 Caitlin was awarded the Department for Education's Young Scientist of the Year.

The two beautiful images below formed part of Caitlin's photography entry in this year's Oliphant Science Awards, which was awarded 2nd prize in the Year 9-10 age group.



Australian Pied Cormorant

to do another Zoom interview with them for the official video tour.



Phoebe Wood
Aldgate Primary School
Project Title: Inside a Rainbow
Poster Category 1st Prize Year 7-8

The 10th of April saw Phoebe and AJ being interviewed together by Professor Flint, the Dean of Science for Dinosaur University for his online weekly interactive dinosaur lectures.

Since then Phoebe has produced some helpful videos for the SASTA OSA website and has completed the Dinosaur Ecosystems EdX course run by the Hong Kong University, passing with 98.3% and she undertook an intensive robotics course to learn more for her planned two year project of a flying model – keep a look out for that one in 2021-22!

The interviews with Phoebe referenced in this article can be found in the Members Area on the SASTA website.



Misty wetlands

Photographing Nature

Student photographers share their thoughts

Three of the topics in the Photography section of this years Oliphant Science Awards (Camouflage; Life in the Wetlands; New Life) encouraged entrants to photograph their natural environment. We asked some of the award winning and highly commended entrants to share their thoughts on why they chose the subjects they did. Also, if they had any photography tips to share.

We hope their answers might help inspire and inform next years entrants; and also bring you joy.

Photographer: Kasimir Kellermann Williams
Glenunga International High School
1st Prize Year 9-10
Oliphant Coordinator: Matthew Maciunas

How did you go about choosing your subjects for the camouflage topic (or did they choose you)?

Every photo that I took this year for the Oliphant Science Awards I came across the camouflaging creatures while in my garden or in greater Adelaide. I started out by taking photos of whatever I felt might fit in to the category and then sorted through them all to identify my favourites, before printing and submitting them. The image of the burrowing frog was a really tricky photo to get right because it was moving around quite a bit. As the frog was covered in soil, it was also hard to focus on.



Do you have any hints or tips for aspiring nature photographers?

Probably my top idea or tip is to be really observant of your surroundings, because it allows you to find little things going on that aren't directly visible when just 'looking at stuff'. This is how I end up finding all these insects and other creatures. Another thing to be mindful of is that although smartphone cameras are getting better, ever since I've invested in a DSLR, my photos have improved by miles. This is predominately because I am able to use manual settings and focus to allow me to really capture the image that I want to see.

Photographer: Faye El-Sayed
St John's Grammar School
Highly commended Year R-2
Oliphant Coordinator: Bronwyn Sharpe

Do you have any tips for students who might like to do nature photography?

Pick the perfect place by looking around to see where to take your photo. You have to use your eyes and wait. It is important to zoom in close with your camera. Then you take a lot of photos so you can pick the best one.

How do you feel when photographing an animal in the wild?

Excited, because I am taking a new photo! I like taking lots of photos of birds because there are lots of different types.



Photographer: Caitie Wroniak

Vale Park Primary School

2nd Prize Year 5-6

Oliphant Coordinator: David Hern

Do you have any tips for students who might like to do nature photography?

I chose to photograph plants because I like nature and often walk Mt Lofty and Adelaide Botanic Gardens with Mum. I am interested in the different types of plants that grow in Adelaide and around the world. So, my advice would be to take photos of everything that you enjoy, and take lots of photos of things that inspire you. I like taking photos of plants and animals, and like the light that early morning brings to photos.

I used the black and white filter in Snapseed. I thought that by making the background black and white, the main subject that I wanted to photograph for the competition could be highlighted in colour. It helped the buds and fronds to stand out a bit more in the photo. I didn't use any other filters for this project.

What do you enjoy about nature photography?

When I take photos I always feel relaxed and calm, especially when photographing nature. It's nice to listen to the sounds around you and to find new things. When I take a good photo, I feel very proud and excited to share them with others.

I was surprised to see many different buds and fronds on our walks, but also how different they look at their different stages of growth. My favourite was the tree fern. It looks completely different at different stages as it unfurls over time.



Photographer: Isla Balestrin

Wilderness School

Highly commended Year 3-4

Oliphant Coordinator: Simone Burzacott-Gorman

Do you have any tips for students who might like to do nature photography?

You have to be very patient. Sometimes you take a lot of photos and only get one great shot that you're happy with. You also need to try and take photos when the light is just right - not too sunny and not too dark either, and the right time of day when the animals are out and about.

With the photo of the duck I took a lot of photos where the ducks were either looking away or bobbing their heads under water. I was really happy when I got the perfect photo of the duck (shown here), especially its reflection in the water.

When my persistence pays off and I can see I've taken a really interesting photo, it gives me a great feeling.

I enjoyed photographing wildlife. It's interesting to see just how many different animals there are around when you actually look for them! It's also really interesting to look at the photos and see all the small details of the animals that you don't usually get to see when looking at them from a distance.



Photographer: Violet Newell

Salisbury Park Primary School

1st Prize Year 5-6

Olipphant Coordinator: Jade Tinney

You took some photographs among the mangroves using a drone.

How did that go?

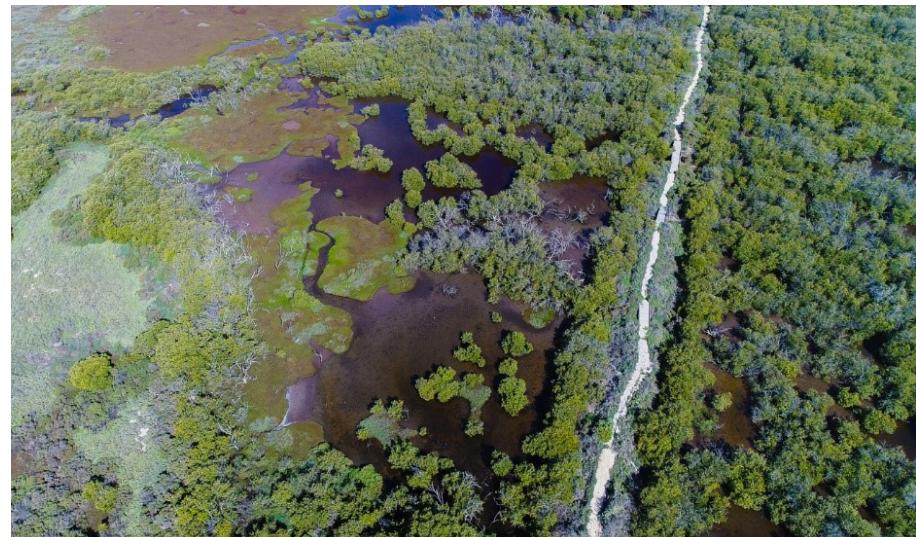
From the outset, I really wanted to do something different. Both my parents work professionally in photography and have had many years of experience and gadgets to use. After seeking permission to use the drone, we decided to venture out to our local mangroves. The first time we visited the mangroves to identify shooting locations, we were chased

out by a swarm of mosquitos who were trying to pick us up and take us away. Unfavourable weather conditions also played havoc on the drone sensor, requiring us to stop and wait for another opportunity.

Taking pictures via the drone had additional considerations with each location chosen based on lighting and the waters reflection. The drone shots are interesting as they allow a different view point of such a beautiful environment.

Do you have any tips for students who might like to do nature photography?

Choose a location with good lighting and symmetry. Lighting is very important. Choose either sunset or sunrise with the sun in the background. This allows the image to capture the subject and draw the viewer's eye to it. Look for patterns and detail in nature. Our eyes are always looking for pleasing or different images to process. Finally use nature's borders as it attracts the eyes to look down a pathway.



Photographer: Aazeen Haider

Mawson Lakes School

Highly commended Year 5-6

Olipphant Coordinator: Vira Wallis

How did you go about finding the flathead fish?

Was there any trick to it?

My brother was rowing at West Lakes, and I accompanied him. I was walking along the shores when I saw baby flatheads, which were camouflaged so well in sand. I always have my camera in our car, so I fetched it and took about 50 photos and selected the best out of them. Taking photos of a subject under water is difficult. The trick is to be as close to the water surface as possible and keep changing angles to handle reflection of sun and your own shadow.

Do you have any tips for students who might like to do nature photography?

The most important trick is to have your camera ready all the time or have a mobile with a good camera, because you never know when you get the opportunity. You must also be patient and let the subject give you the opportunity to take that perfect photo. If you are pushy, you will scare the subject away.



Photographer: Summer Winwood
Concordia College
2nd Prize Year 7-8
Olipphant Coordinator: Joanne Rogers

You took photographs of the life cycle of a butterfly. How?

Making sure to capture the full life cycle was the hardest part especially attempting to do it in an unprotected outdoors environment. I managed to take the majority of the photos while in their natural habitat but some of the more delicate ones like the cocoon were taken indoors. To do this I took milkweed (the plant the caterpillars feed off of) and created an artificial habitat for them out of a big plastic box and then a thin mesh placed over the top. The mesh was especially important as once they went into pupation, they needed somewhere to form their cocoons. I ended up with all the cocoons along the top and once they hatched out, the butterflies were re-released into their natural habitat.



Photographer: Joshua Clothier
Immanuel Primary School
1st Prize Year 3-4
Olipphant Coordinator: Sarah Nash

How did you set up and stage the photographs so that you were able to capture the life cycle of the butterfly from caterpillar to adult?

To capture the life cycle of the butterfly, I placed the caterpillars in a pot containing milkweed on my desk in my room. I set up my iPad, using books to ensure I got the right height and angle to capture the caterpillars movement, growth and change. As the lighting was not the best, I set my desk lamp at an angle that allowed the right amount of light to capture the images. I then set the iPad on time-lapse.

Once I had captured the continuous process of metamorphosis, I went through all the footage and chose the best possible individual frames from the time-lapse footage to represent the miracle of metamorphosis.

How did you feel when looking after the butterflies through all their life stages?

I felt grateful and truly amazed to be able to successfully care for the caterpillar so it could change into a butterfly. To watch it happening so close to me was just incredible. It made me think about God's creation and all he made.



Country Schools: Participating in the Oliphant Science Awards

The Oliphant Science Awards (OSA) are open for all South Australian schools to enter – whether that be entering individual students or entire student cohorts. We asked the Oliphant Coordinators from 3 different regional schools about their involvement with the competition. Here are their responses along with images of some of their prize-winning entries for this year. With entries for many categories now able to be submitted online it has never been easier for schools to participate.

Alexandra Fowler Woomera Area School

Woomera Area School travelled the most distance of any school to deliver their projects for judging. We asked Alexandra why she gets her school involved:

The most special thing about this year's OSA for me was the enthusiasm my students had for the competition. This was our second year contending. From the first day back at school I had students asking when we would start. Their enthusiasm was contagious with any opportunity to create an entry during our lessons being pursued.

Students asked to do posters while studying forces and the discovery of bush food plants in our school was a great find. My students also began begging me to take the cameras out at breaks.

We are only a small school. However, we had more entries than students, with one student sending in four entries (she had planned a fifth but time thwarts the best plans).

Seeing the enthusiasm from my students was amazing. As much as it takes a dedicated coordinator to run the OSA in a school, it is useless if the students don't want to do it. The 1,000 km return trip to Adelaide was worth every single second because of my students.



Aislinn Lauder, Woomera Area School
Category: Models & Inventions
Project Title: The Evolution of the Horse
3rd Place Year 5-6

Fleur Nattrass Williamstown Primary School

How can you get your school involved in the Oliphant Science Awards? Fleur Nattrass gives her suggestions:

To get started, I would recommend schools look at the brilliant work students already produce within their science programs. Without making changes, you may find students are already completing projects which fit the Oliphant Science Award categories. At Williamstown Primary, we identified the independent scientific investigations our Year 7s were conducting were suitable to enter. In 2019 it was exciting when our Year 7s were awarded prizes. Other students saw how they had enjoyed the opportunity to participate in the Oliphant Science Awards which encouraged them to also be involved. This year, we were impressed by our Year 7s who not only completed their inquiries but independently uploaded their entries.

Once our older students had generated Oliphant Science Award excitement, our younger students were eager to enter a project.



Ben Cameron, Heidi Travers & Evan Fleet
Williamstown Primary School
Category: Models & Inventions
Project Title: Pinocchio Power
Highly Commended Year 3-4

A keen group of year 2/3 students met at lunch times in the science room and started playing with tools and equipment. By giving them this opportunity, the team found interest in hydraulic machines and decided to create a Pinocchio head with a moving hat and nose. The team met at lunch times for many weeks to complete their model and parents assisted with project delivery and collection. While students were excited to finish their model entry, they were also delighted to receive a highly commended award and see their work displayed on the Oliphant Science Awards website.

**Julianne Koopman
Eastern Fleurieu R-12 School**

Julianne, an experienced Oliphant Judge, has been involving her school in the Oliphant Science Awards for several years. They have had a good deal of success as the photo of their awards testifies.

Eastern Fleurieu School has been involved with the Oliphant Science Awards from the early 2000s. Our school has had a lot of success with individual winners and numerous country school awards.

We offer the competition to all students in Reception to Year 12 with the aim of promoting and fostering an interest in science. The competition gives students an opportunity to be creative with science and be involved outside the classroom. With the broad range of categories and topics offered, students can enter a project of their own interest.



Isla Wagenknecht & Erika Main
Eastern Fleurieu R-12 School
Category: Games
Project Title: First to Earth
Highly Commended Year 5-6

Students receive support either in class, lunch or after school, or by providing them with materials, but the majority of the work is completed as a home project. This forces students to follow category instructions and manage their time effectively.

Our school allocates house points for all extra-curricular activities on top of sports day & the swimming carnival, so it is a great way for non-athletic students to contribute points to their house.



Awards won by students at the Eastern Fleurieu R-12 School

Why not submit electronic entries online?

Entries for categories such as scientific inquiry, science writing and multimedia have now moved entirely online. Other categories also lend themselves to online submissions. For example, Winston Telfer (from Eyre Peninsula) submitted a video of his award-winning model - The Not-so-simple (Ball) Machine. **The video of the machine operating can be viewed at: https://youtu.be/RF6b_iOljXM** It is clever; it is mesmerising.



Winston Telfer
Lower Eyre Peninsula Home School Group
Category: Models & Inventions
Project Title: The Not-so-simple (Ball) Machine
3rd Place Year 7-8

SASTA supports regional school participation in the Oliphant Science Awards with its New & Country Schools Initiative. Schools who have not participated in the past five years and country schools wanting assistance for registration fees are eligible to apply for support.

Selected schools will receive support up to a maximum amount of \$200.00 towards entry registration fees.

Psychology Teachers Summer Conference 2021

Friday 15 January 2021, Education Development Centre

Gearing up for the New Curriculum!

9:00 am	Welcome	Carolyn Pinchbeck
9:15 am	Keynote Address: <p>Geof Boylan-Marsland is one of South Australia's leading psychologists with 14+ years of experience in the field. Geof is Senior Psychologist at 'Mind Matters Psychology', previously South Australian Sports Institute (SASI), located in Findon South Australia and is a leading Psychology Consultant for Sports Med. SA. Geof specialises in the areas of sport, performance and exercise psychology – with an emphasis on improving performance, well-being and mental health in athletes; as well as practicing General psychology – including Mental Health Care.</p> <p>Geof has helped Olympic and Paralympic athletes achieve success at 2012 London Olympic and Paralympic Games, 2014 Glasgow Commonwealth Games, 2016 Rio Olympic and Paralympic Games, 2018 Gold Coast Commonwealth Games and World Championships; and has also provided Psychology services to the AFL Player's Association, South Australian Sports Institute (SASI), NSOs (Rowing Australia, Shooting Australia, Table Tennis Australia), Adelaide Thunderbirds Netball Team and Netball Australia, as well as numerous other Institute based sports including track & road cycling, water polo, track & field athletics, BMX, table tennis, swimming and gymnastics.</p> <p>In his keynote address Geof will present his viewpoint about the role of a sports psychologist in today's society, and discuss the key elements that he believes will be engaging, inspiring, and valuable for teenagers to learn about in a Stage 1 Psychology classroom in preparation for the New Stage 1 Psychology Curriculum in 2021.</p>	
10:15 am	Morning Tea	
10:30 am	SACE Examination and Moderation Review	Supervising Panel Representatives
12:00 pm	Concurrent Workshops Session 1	
	1.1 Indigenous Psychology	Kate Cutts, Link Education Professionals
	1.2 Forensic Psychology	Nicole Marinos, OLSH College
	1.3 Implementing the new 'SHE' Task into Psychology	Jessica Mosca, Thebarton Senior College
1:00 pm	Lunch	
1:30 pm	Concurrent Workshops Session 2	
	2.1 Let's get PRACTICAL!	Heather Carter, Henley High School
	2.2 Indigenous Psychology	Kate Cutts, Link Education Professionals
	2.3 Forensic Psychology	Nicole Marinos, OLSH College
2:30 pm	Concurrent Workshops Session 3	
	3.1 Implementing the new 'SHE' Task into Psychology	Jessica Mosca, Thebarton Senior College
	3.2 Let's get PRACTICAL!	Heather Carter, Henley High School
	3.3 Psychological Literacy	Kate Cutts, Link Education Professionals
3:30 pm	Conference Plenary	Carolyn Pinchbeck

Full program and registration at www.sasta.asn.au/professional_learning

Limited places available!

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Biology: Levels of Life

Brian LeCornu and Tony Diercks

Biology: Levels of Life – Australian Curriculum Edition Textbook

\$63.40

This textbook provides detailed coverage of all the content (Science Understanding) of the SACE Stage 2 Biology subject. The new content is relevant, up-to-date and addresses Science as a Human Endeavour, with many examples throughout. It is attractively presented in full colour with numerous links to videos, animations, and useful resources. The textbook is divided into four topics, with each topic presented in chapters designed to make the material easy to follow, with study questions at the end of each chapter.

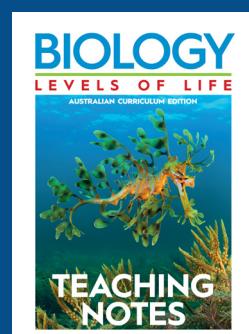
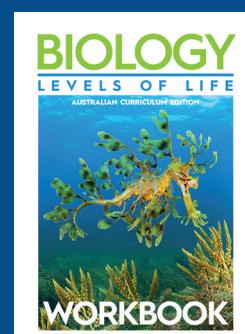
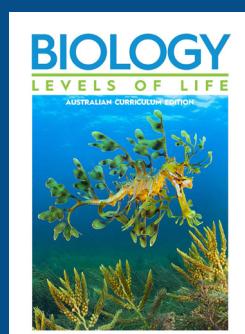
Biology: Levels of Life – Australian Curriculum Edition Workbook

\$24.40

Written specifically to complement the textbook, this workbook covers all Science Understandings of the Biology subject outline. It can be used in conjunction with the textbook or on its own as an aid for understanding and revision. By completing answers to the workbook questions, students will develop their knowledge and understanding of biological principles and concepts.

Biology: Levels of Life – Teaching Notes, \$120.00

Teachers will find the Teaching Notes invaluable in ensuring that all Science Understandings are covered for each of the four topics. The book is designed so that when open on the desk the pages lay flat and the notes can easily be seen at a glance. There are teaching tips throughout as well as additional information. Answers to questions in the Workbook will assist teachers in explaining concepts to students.



Updated to match minor changes in the subject outline for 2020

Judging the Oliphant Science Awards

What is it like to be a judge in the Oliphant Science Awards? We met some of this year's judges and asked them why they think the Oliphants are important, why they judge and whether they had any hints or tips for entrants.

Poster Category

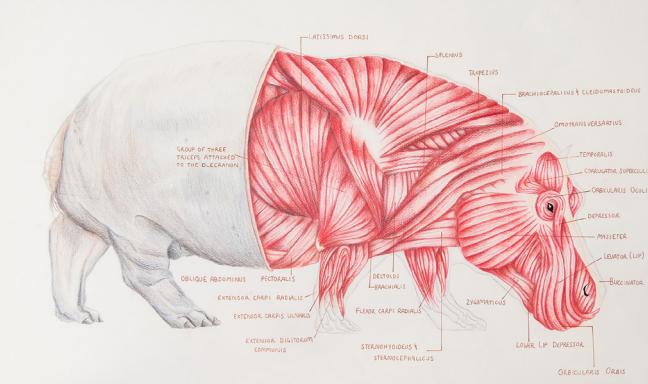
Charlie Marino (Unley High School) has been judging the poster competition for 25 years:

"Working with other judges we come up with the entries we think are the champion ones, rank them, and then we have a discussion to decide first, second and third. We come up with a consensus. There's a lot of integrity in the way we select the winners."

The enjoyment in judging is in seeing what students do across the state; being with colleagues; and seeing some really spectacular stuff. The Oliphants bring schools together in the sense that we're all sharing common ideas; seeing if there are consistencies in the way that people do things. At the same time seeing diversity and imagination; the really outstanding ways in which young minds think. Young people have some great ideas and they need to be shared and celebrated."

HIPPOPOTAMUS

(*Hippopotamus amphibius*)



Student: Isabelle Lilburn
Title: *Hippopotamus amphibius*
School: Loreto College
1st Place Poster, Year 11-12

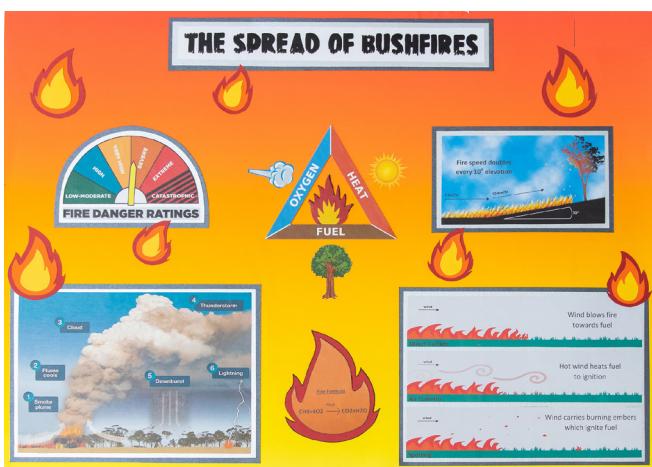
Charlie's tips for entrants:

"The posters that stand out are the ones that hit you with a message. They link beautifully with the topic and they attract you in such a way. There's something there. Imagination. Something that pulls you towards it. There's been a number of those over the years."

Chris Sedunary (Country Fire Service) was once a teacher and an Oliphant Coordinator. Now with the CFS, Chris has an interest in disaster resilience education (see SASTA Journal Issue 1, 2020):

"That was my doing getting the bushfire title into the poster category this year. The aim is to try and motivate students to start thinking of bushfires and to start exploring them."

The CFS has an interest in promoting disaster resilience in schools in collaboration with the Institute of Disaster Resilience. The CFS has a new child and youth officer to work with schools."



Student: Tahlia Keegan
Title: *The Science of Bushfires*
School: St John's Grammar School
2nd Place, Poster, Year 9-10

Chris' tips for entrants:

"A poster must be visually appealing so that when someone sees it, it is eye-catching and they are drawn in to want to look at it. But then once looking at it you have got to be able to learn something as well without it being cluttered. So, it has to look good and needs some key-points to focus on."

The South Australian Country Fire Service is developing a new Child and Youth Bushfire Education Program. If this interests you contact Belinda Dunbar at: belinda.dunbar@sa.gov.au or during office hours on 08 8115 3324 (Wednesday to Fridays).

Sarah Todd (Coromandel Valley Primary School)

is into her fourth year judging as well as her fourth year as a Coordinator.

"I enjoy seeing what students come up with and the time and effort they have put into creating their understanding of science."

For schools, participation in the Oliphants shows there are people who are interested in science and it might encourage others to engage in the science competition - planting a seed for the future."

Sarah's tips for a good poster:

"Try not to put too many words on it. It's got to be a clear scientific message with limited text. It needs to be visually appealing with pictures or photos."

Games Category

Anita Trenwith (Uni SA Connect Team: SASTA Board) has been involved in judging for 4 years during which time she has judged posters; photography; games; and multimedia several times.

"I became involved because my son entered the Oliphants and really engaged in science as a result of it. I wanted to give something back so I volunteered to judge. I really enjoy it because I get to see the amazing projects students produce."

The Oliphants give students an opportunity to participate in a science activity that is their own passion. They aren't limited to having to do it on a particular topic (recognising though that some of the categories follow themes). So, if you're passionate about something you can invent your passion into it.

My son is now into his 5th year of entering Oliphant Science Awards and he is very driven. He's even made some videos for SASTA now. Initially it was multimedia. Then it was multimedia and scientific inquiry. Then he thought he could do a photography one as well. Every year he adds an extra category and gives it a go. He's planning to enter 4 categories next year. He's started working on them already."



*Students: Krystelle Tham, Grace McIntyre, Giselle Stevens
Title: Life of Bees
School: Scotch College
Highly commended, Games, Year 5-6*

Anita's tips for a good game:

"My biggest hint is read the rules. We have some brilliant entries that don't get across the line because they don't meet the size limit or category criteria. Each category has a rubric. Keep it in mind. Also, ultimately it is a science competition. Make it about science."

Dagmar Preusker (retired) has been a judge in the Oliphants for 12 years.

"The Oliphants are important to get kids engaged in science in practical and scientific ways. The Oliphants have such a high prominence in SA. The BHP Foundation Science Awards (www.scienceawards.org.au) are more high-end whereas the Oliphants allow everyday schools to participate on the same level as our high-end colleges."

I am a judge because I love childrens' creativity. I love seeing how they apply science in a fun way. I enjoy finding those little gems. You do not get them every year but now and again I look at an entry and go, I wish that one was in production – I would love to use that in my classroom."

Dagmar's tips for a good game:

"Follow the criteria and get some science in it. The rules are there for a reason. When it comes to games, the first thing we consider is presentation. I have seen so many games lose out because the presentation is not there. When we go to buy games it is a marketing aspect. We look at the box, we look at the pictures. There's a lot to get right."



*Students: Lilly Gao, Max Lock, Aaron Walsh
Title: To catch a Cuckoo
School: Highgate School
3rd Place, Games, Year 7-8*

Models & Inventions

Sam Moyle (Brighton Secondary School) has been judging the Oliphants for around 10 years.

"The Oliphants give students an opportunity to stretch their interest in science. That might be away from the curriculum for their particular year level - so, they can really pursue their passion projects."

I really love seeing the innovation from students from all over the state - especially the primary

school students who really set the bar for creative expression of science concepts.

I often want to use the cool model and invention ideas from the students in my classroom. I think last year it was a magnetic board for doing DNA coding that took my interest. This year there's some cool things with friction and herd immunity... and stuff from the juniors that I want to implement with the seniors."

Sam's tips for models & inventions:

"Inventions need to have an interaction component. We're not getting as much of that as we should. Students need to focus on how their model or their invention is interactive and how can they take it to the next level beyond just touch a button and light something up. How can they really convey that information and use that interactivity in a way that means they are really authentically conveying information, as opposed to I'll just have a button to press so that I hit that criteria.

I would love students to look at the models and innovations category as an opportunity to solve problems - so link it in with the science as a human endeavour concepts. Rather than just demonstrate how the solar system or a beehive work. How can we look at problems of now, and problems of the future and how can we come up with solutions for that and really be innovative in terms of that?"



Student: Regan Nelson
Title: The Skyhook Propulsion System
School: Prince Alfred College
1st Place, Models & Inventions, Year 9-10

Maria Caruso (Walford Anglican School for Girls) has been a judge in the Oliphants for 20 years.

"I've judged most of the categories. It can be hard, but you try and avoid (categories and year levels) with your own school and it's great seeing what students come up with in other schools."

The Oliphants bring science into the home where it facilitates discussion between parents and students and gets them engaged and thinking about areas right from when they're really little.

The Oliphants also help students get set up for Year 12 by practicing in the younger years. Young participants learn lots of transferable skills like

working in teams; planning; failing; readdressing; adjusting and using initiative. A project can be a disaster at year 6 or 7. They might learn that their friendship groups aren't necessarily the best working groups. They can work out that a plan can be too big and not achievable. Then by the time they get to Year 12 they have it all worked out. Of course, the Oliphants is also about having fun too."



Students: Mya Nickels, Bella Mitsud, Chloe Easson
Title: Discover Space

School: Immanuel Primary School
Highly Commended, Models & Inventions, Year 3-4

Walford students have a history of doing well in the science writing category. Do you have any tips?

"I probably need to give credit to the English department, not so much the Science department on that one. It's the girls - I think the girls really enjoy that element of research and writing creatively. It's allowing them to learn about something where the choice of topic they actually control, not us. And they can present in a way they wish to present, not in a way we deem it should be presented. I find you get a lot more creativity rather than say this is what we're going to do, this is how we're going to do it, now bang go ahead and do it. I think it sets them up for the senior years more than anything."

Maria's tips for models & inventions:

Inventions have to be interactive. If the judges don't do anything, if we're just looking at the model it doesn't meet the criteria. Also, I'd highlight the importance of the risk assessment – students really need to show us what they did to make sure they were safe in whatever they were building.

The Poster, Games, Photography, Models & Inventions and Crystal Investigation categories were all judged during a single Saturday morning session hosted this year at Festival Functions. Prior to judging, SASTA staff, convenors & volunteers have all the entries meticulously labelled, sorted and presented in a spacious venue – the organisation is a credit to everyone involved, perhaps most notably the Oliphant Coordinators at participating schools.

With everything set up ready for them, the judges truly find the judging an enjoyable experience with a chance to catch up with other teacher peers in a relaxed way. Morning tea and lunch were provided.

Oliphant Science Awards

Crystal Investigation - some tips

To develop a really good quality crystal requires a level of planning, care and delivery of the method - which is all about scientific method. It develops in students the skills of planning, failing sometimes, and then trying again by modifying their techniques to make things more successful.

Lynton Hall, retired Principal and member of the Royal Australian Chemical Institute (RACI) has been a judge in the Oliphant Crystal Investigation for years:

"Looking at the crystals this year, there were a few outstanding crystals and lots of not so good crystals. I think that perseverance is important. Being careful with preparation of solutions, cleanliness is really important and it is also important that participants read through the rules.

Part of the process is to actually put forward a hypothesis and then to test it. There are lots of entries that we saw this year where a hypothesis was proposed, but it wasn't actually tested very well. So, the students that did perform well, not only produced good quality crystals, but did actually test their hypothesis - about temperatures; or types of water to grow the crystals in; or other conditions that they varied. My advice would be, to take time to read through the rules and instructions prior to commencing the project."



Student: Iknoor Khurana
School: Brighton Secondary School
1st Place, Crystal Investigation, Year 9-10

There are some excellent resources available to any student looking to create their own perfect crystal.

The RACI has a collection of crystal growing resources on its website:

https://raci.org.au/Web/Schools/Crystal-Growing/SA_CrystalGrowing.aspx



South Australia Crystal Growing Competition

This section is intended to provide information to students and parents, and to teachers involved in crystal growing for fun or for competitions such as the Oliphant Science Awards in South Australia or other crystal growing competitions in other Australian states or indeed overseas.

The majority of competition rules are concerned with the use of materials such as aluminium sulphate i.e. potash alum crystals. No other material is acceptable for prize consideration.

Students are asked to carry out all aspects of the material safety data sheet (MSDS) when there is a safety issue e.g. hot water. The operations may be carried out at home or at school according to the supervising teacher's discretion. To ensure the crystal growing is the student's own work, the required log book should be checked periodically and some questions asked about the most recent activity.

Other rules which apply to the competition, that a participant wishes to enter should be located and read on the appropriate website - for example, the rules for the Oliphant crystal growing competition can be found on the Oliphant Science Awards website.

Packaging the finished crystal for the competition is important. The finished dry crystal should be placed in a small airtight plastic bag and placed in a Post Pak for posting. The accompanying logistics can be placed carefully folded into the Post Pak or sent separately. [Any crystals wrapped using sticky tape will not be judged].

Judging
Judging of the presented crystals is conducted by experienced members of the RACI Chemical Education Group in any state.

Crystals will be judged on the following criteria:

- regularity i.e. sharpness of edges,
- symmetry
- clarity - overall aesthetic appeal

Note: no longer a major criterion. This will reduce disadvantage to students, who for one reason or another, have less growing time. However, crystals whose largest dimension is less than 5 mm will not be considered for certificates of merit.

Looking abroad, the USA crystal growing competition website contains its own collection of crystal growing resources including some highly recommended video links to Jason Benedict, a Crystallographer based at the University of Buffalo. In his videos Jason steps students through all the stages required to successfully grow crystals.

<https://www.uscrystalgrowingcompetition.org/crystal-growing>



[Home](#) [RulesHandbook](#) [Entry Form 2020 registration](#) [Media](#) [The Team](#) [Crystal Growing](#) [USCGC Winners](#) [Support the Contest](#) [More...](#)

Crystal Growing Guide

Helpful advice for growing single crystals can be found at the following:

[YouTube video tutorial by Dr. Jason Benedict on the Benedict Research Lab YouTube Channel](#)

[Follow us on twitter \(@USCGrowingComp\) and check out some of the great hashtags of previous contests: #2014USCGC #2017USCGC #2018USCGC](#)

[Wisconsin Crystal Growing Contest run by Dr. Ila Guzel](#)

[Great examples of alum single crystals - Winners of the Canadian Crystal Growing Contest](#)

Or follow the instructions below.

Expert Crystal Growing Guide:

1. What you'll need

-100 g of starting material (alum or copper sulfate)
Large container (e.g. large cup, 400 ml beaker)
-other stuff...

2. Making a supersaturated solution



CSIRO: Sustainability Education Programs for Schools

The previous edition of the SASTA Journal had a focus on Citizen Science. Following up on this theme, here Bill Flynn gives an overview of two internationally resourced Citizen Science Programs that are supported in Australia by the CSIRO.

Bill Flynn, Education Specialist, CSIRO Education & Outreach

The CSIRO recognises the importance of developing the knowledge and skills necessary for a sustainable future and is committed to engaging and supporting students, teachers, and the broader community in this space. CSIRO Education and Outreach has had a strong presence in sustainability education since the inception of CarbonKids (now Sustainable Futures) in 2009.

Nationally, the CSIRO works closely with teacher associations, industry and educational organisations to develop and deliver sustainability focused resources and professional learning.

Currently, CSIRO Education and Outreach offer two complementary sustainability programs, these being:

1. The Globe Program
2. Sustainable Futures

The aim here is to give an overview of both of these programs.

The GLOBE Program

The NASA sponsored GLOBE Program (<https://www.csiro.au/en/Education/Programs/GLOBE>) is a worldwide community of students, teachers, scientists, and citizens that are working together to better understand, sustain, and improve the Earth's environment at local, regional, and global scales through observing, measuring, collecting, analysing and sharing data. The 25th Anniversary of the GLOBE Program was celebrated on Earth Day in April of this year.

GLOBE provides a number of ways users can engage with the program, the two main options being - ***The GLOBE Program and GLOBE Observer App.***

The ***GLOBE Program*** gives teachers and educators full access to the program including eTraining, teacher guides and classroom activities.

Each of the four primary spheres which make up the program - atmosphere, biosphere, hydrosphere and the pedosphere (soil) - contain a series of 'sub-topics' or individual focus areas for further investigation (observation, measurement, collection, analysis and data sharing).

NASA have developed and provided detailed protocols to ensure uniformity and scientific rigour during the measuring and data collection process.

These GLOBE protocols are designed to help students develop a wide range of 21st Century skills, including critical thinking, scientific research methodologies, data analysis, independent learning, and big-picture thinking (taking local information and seeing global implications).

To record data into the GLOBE database, schools register for GLOBE (free) and once a teacher has completed the appropriate online protocol training, their students are ready to start adding observations and data. Teachers, students and scientists from around the world have access to and use of any data entered into the global database.

All data and images uploaded to GLOBE are available to users through the GLOBE Visualisation System. The system offers an easy user-friendly means of visualizing and retrieving data. Users are able to retrieve data for their site as well as data entered at any other site registered on the GLOBE system. The visualisation system provides users the option of displaying data in a variety of maps, graphs, and data tables, using specific search criteria. Users may also download data for use in their own analysis systems.

GLOBE's website is home to a wealth of resources for K-12 students, including a Teacher's Guide, tried and tested classroom activities, a description of GLOBE's research protocols, and Elementary GLOBE, which is a series of age-appropriate storybooks that help young ones understand Earth Science topics.

The screenshot shows the 'Atmosphere Community' section of the GLOBE website. It features a 'Featured' section for the 'Urban Heat Island / Surface Temperature Campaign'. Below this, there is a photo of two people in a park setting. A call-to-action button says 'New to GLOBE? Visit the Get Started Section'. At the bottom of this section, there is a link to 'Protocols'.

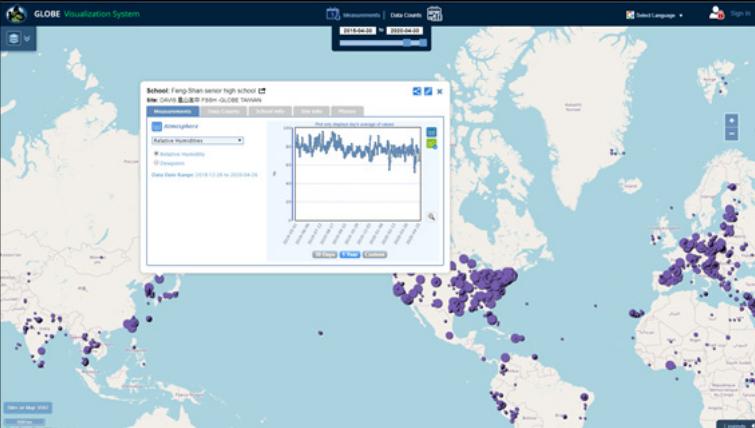
PROTOCOLS

Aerosols | Air Temperature | Barometric Pressure | Clouds | Precipitation

RESOURCES

Classroom-ready Activities | Learning activities | Find a Collaborator | Equipment

Five of the focus areas within Atmosphere with protocol links



Global relative humidity data counts 2015-2020 and Feng-Shan Senior High School, Taiwan relative humidity measurements 05/2019-04/2020

If your preference is a mobile phone app then the **GLOBE Observer app** might be for you. The app currently includes four main tools: Clouds, Mosquito Habitat Mapper, Land Cover and Trees. Clouds observations help NASA scientists understand clouds from below (the ground) and above (from space).

Clouds play an important role in transferring energy from the Sun to different parts of the Earth system. Since clouds can change rapidly, frequent observations from citizen scientists can help complete the scientific picture.

Mosquito Habitat Mapper makes it possible for citizen scientists to observe, record and share the locations where potential disease vectors are breeding.

Land Cover enables citizen scientists to photograph the landscape, identify the kinds of land cover they see (trees, grass, etc.), and then match their observations to satellite data.

Tree observations allow citizen scientists to measure tree height (and optionally tree circumference) to track the growth of trees over time. Tree height is the most widely used indicator of an environment's ability to grow trees.

Future versions of the GLOBE Observer app will add additional tools to help users further contribute to the global scientific community.

A few ideas using GLOBE in the classroom

Any number of GLOBE protocols provide an ideal basis for a STEM activity. For example, here is an idea for your classroom using the current temperature protocol found in the Atmosphere sphere:

1. Have your students carry out the protocol for current temperature (use an online tool such as <https://www.timeanddate.com/sun/australia> to find local solar noon) and record their results
2. Average the group results and determine current temperature for your site
3. Upload data to the GLOBE database.

Now that your students' data is on the GLOBE database here are a few suggestions for possible activities using the Visualisation Tool:

- Compare the Solar Noon Temperature Dailies with your site and other sites in Australia
- Compare the Solar Noon Temperature Dailies with your site and other sites around the world. Sites selected could be along the same, or as near as possible, line of latitude or longitude
- Choose 2 areas at different elevations with Solar Noon Temperature data and compare their records
- Look back at recorded Solar Noon Temperature Dailies data for any changes over time.

Some of the questions you might ask your students to investigate:

- Does Solar Noon Temperature vary between sites/regions?
- If it does vary what might be some of the factors that cause the variation?
- Could climate change have any impact on Solar Noon Temperature?
- Thinking about climate and global temperatures what impact, if any, might changes to these have on food production and the flora and fauna of an area?

CSIRO's Sustainable Futures

Sustainable Futures offers teachers access to classroom ready, high-quality support materials which contain a comprehensive range of hands-on, student-centred, activities. All support materials have a clear sustainability focus, incorporating the three strands of the science curriculum – science understanding, science inquiry skills and science as a human endeavour.

The free resources approach sustainability from a futures mindset, challenging students to not only think about the now, but to consider what tomorrow and beyond might look like. Each resource has a specific theme as its focus, for example the Sustainable Energy for All unit invites students to contemplate five different visions for the future and consider the role of energy and science in each of these. Students develop their understanding of energy by considering the energy chains associated with different energy sources and reflect on the advantages and disadvantages of each.

The themes span middle primary years through to lower secondary. Each of the resources incorporate other areas of the Australian Curriculum, such as Geography, Mathematics and English.

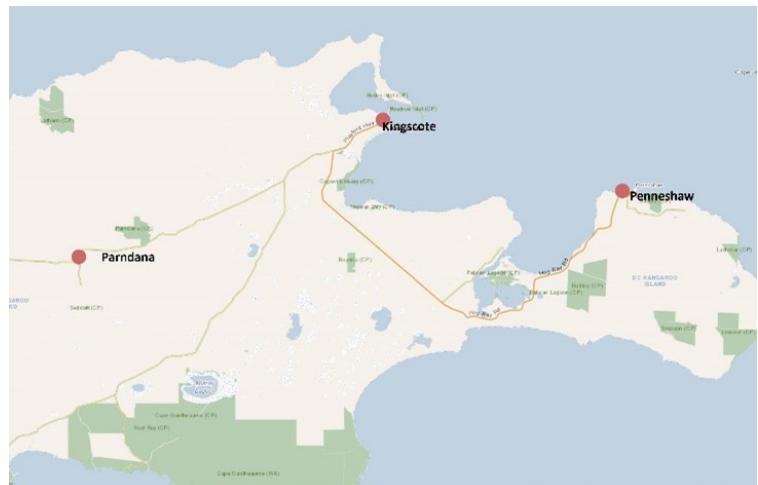
Using both GLOBE and Sustainable Futures programs together can enrich your students' learning in sustainability education helping them develop the necessary knowledge and skills for a sustainable future.

If you would like to register for either of our programs or to attend a free program webinar with our expert staff, please head to our website. www.csiro.au/education

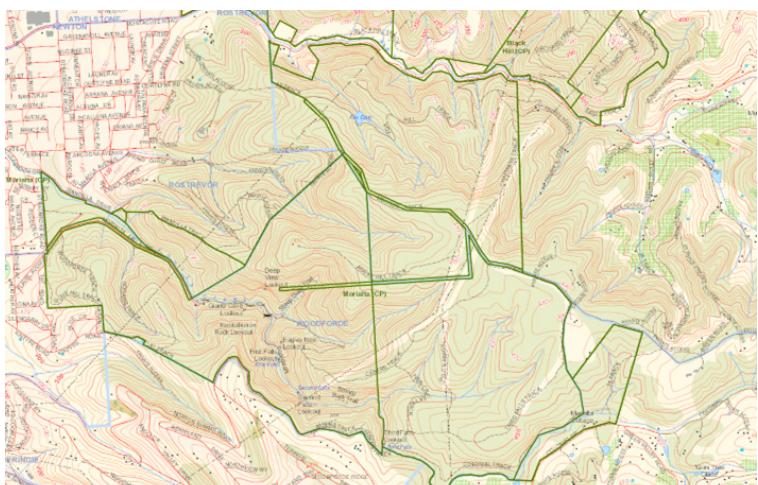
Mapping South Australia with the Location SA Map Viewer

The Location SA Map Viewer (location.sa.gov.au/viewer) is a free, online, simple to use static map of SA upon which you can superimpose and view datasets ranging from the location of historical earthquakes to shipwrecks; national parks to aquatic reserves; fire ban districts to bushfire safe places; recreation trails to bikeways. The website allows SA Government authorities to share data of public interest. Maps are available for viewing as road, satellite or topographic variants. There are even simple to use tools to calculate distances and areas.

After reading the article in this edition on Kangaroo Island Community Education, you might be wondering where to find the campuses at Kingscote, Parndana and Penneshaw? Generating a road map on Location SA will take you right there.



Upon reading Bruce Baker's article on the Adelaide International Bird Sanctuary (also see SASTA Journal 01/2019) you could generate a satellite image of the sanctuary and perhaps even map out the area of its landcover and adjacent land uses. The site also lets you view high and low tide water marks.



After reading Bob Baldock's excellent article on planning environmental educational visits to National Parks (see SASTA Journal 01/2019) you could call up a high resolution topographical map of Morialta Conservation Park, or any other conservation park in SA.



Watch this!

Science demonstrations for primary and middle school students

**Associate Professor (Adjunct) Chris Dawson,
The University of Adelaide**

Chris Dawson has written two books: Watch this! and Watch this too! that each include over 100 quick and easy demonstrations; both are available for purchase from the SASTA website.

Squashed Can

Materials, structures

What you need

- An empty, undeformed soft drink can

Method

1. Ask a student to stand on the can, ensuring that this is done carefully by putting the weight directly on top, not at an angle. Let the student use your shoulder as a support if necessary.
2. Flick the side of the can with your finger. Caution with this (see observation).

What you observe

The can collapses immediately when it is flicked.

Explanation

The pressure exerted by the student is initially directed straight down the sides of the can. Any deformity changes this, and the can collapses rapidly.

Ball up

Momentum

What you need

- Two balls of different sizes e.g. a basketball and a table tennis ball (easier to do) or a tennis ball and a table tennis ball

Method

1. Drop the two balls next to each other from the same height (about 1 metre).
2. Observe how high each one bounces.
3. Now sit the smaller ball directly below, and touching, the larger ball.
4. Drop the two balls together so they keep in line.
5. Observe the relative bounces.
6. Now sit the smaller ball on top of the larger ball.
7. Drop and observe.

Caution: take care not to stand over the bouncing balls

What you observe

When dropped separately, the two balls bounce to about the same height, which is lower than the original dropping point. With the smaller ball below, providing the two balls keep in line when they bounce, the smaller ball doesn't bounce up, but the larger one bounces very slightly higher than in the first test. With the smaller ball above, the larger ball bounces to slightly less than the original height, but the smaller ball bounces much higher.

Explanation

The reason for this is that momentum (where momentum is the 'motion content' or 'mass in motion' of a body and is defined as its mass \times velocity ($p = m \times v$)) is always conserved. When the basketball is on top, the momentum of the tennis ball (small because of its smaller mass) is transferred to the basketball, which then rebounds with a slightly greater velocity, and therefore to a slightly higher point, than it would have done otherwise. With the tennis ball on the basketball, momentum is transferred from the basketball to the lighter tennis ball giving it a higher rebound velocity and propelling it further into the air.

This transfer of momentum from a heavier, slower moving object (such as a cricket bat, or a tennis racquet) to a smaller ball, hence making the lighter ball move much more quickly than the bat, is a fundamental part of many sports.

Extension

To be really clever, add a table tennis ball on top of the tennis ball/basketball combination. Momentum is transferred from both the larger balls to the table tennis ball, which flies!

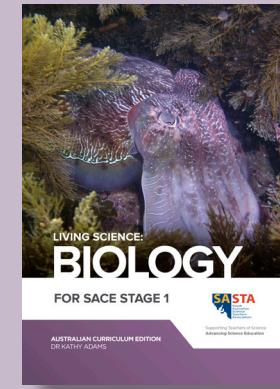
Living Science: Biology

Teachers will find these textbooks an invaluable resource for planning and developing student knowledge as it has comprehensive coverage of the science understandings of the Stage 1 & 2 courses. Students will find it a great resource to complement lessons and will develop a broader knowledge of Biology across many different contexts.

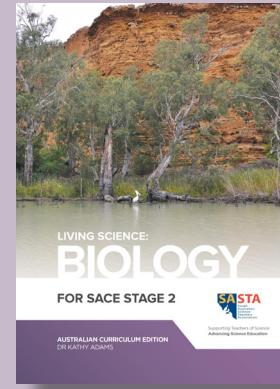
'Did you know?' breakout boxes throughout the text include related stories, concepts, perspectives and facts to help engage students in deeper learning.

'SHE Alert' boxes are connected to the four SHE Key concepts: Communication and Collaboration, Development, Influence, and Application and Limitation. These sections give students and teachers opportunities to consider how science and society interact to find solutions and overcome problems.

There are review questions throughout the books and at the end of each chapter. The Stage 1 textbook also has a list of possible Deconstruct and Design ideas at the end of each chapter, which could be used by the teacher to develop tasks.



\$49.00 each



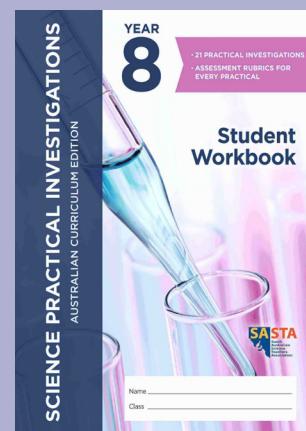
\$54.00 each



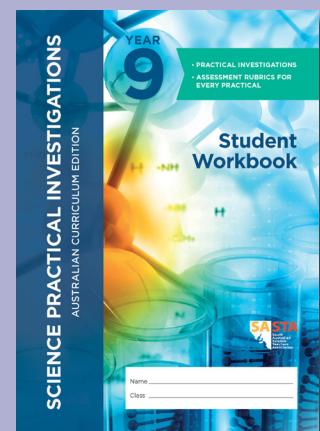
STUDENT WORKBOOKS

These write-in workbooks guide students through practical investigations, encouraging them to practice and enhance their inquiry skills, design procedures and answer questions about their learning.

- Explores Biological sciences, Chemical sciences, Earth and Space sciences and Physical sciences for the Year 8 or 9 Australian Curriculum
- Explanations of how to work scientifically, including manipulating variables, graphing and measurement
- Emphasis on science inquiry skills
- Assessment rubrics for each practical
- These workbooks reflect the current emphasis on STEM skills through the inclusion of Engineering Design Challenges



\$18.50 each
minimum order 20 copies

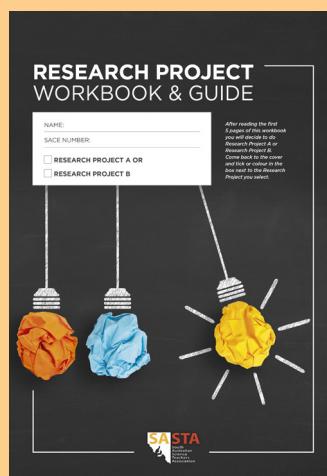


RESEARCH PROJECT WORKBOOK & GUIDE FOR SACE STAGE 2

This step-by-step workbook guides students through the three parts of the Research Project: the Folio, the Research Outcome, and the Evaluation/Review.

Students are guided through activities and supported with information to enable them to: generate an idea; develop a research question; plan, conduct and analyse research; and then structure a research outcome and an evaluation or review with a focus on achievement of the performance standards (at a high level).

Along with activities and information, the workbook also includes sections that enable students to organise and store hard copy project material.



\$39.00 each

Available from sasta.asn.au

STUDENT WORKBOOKS

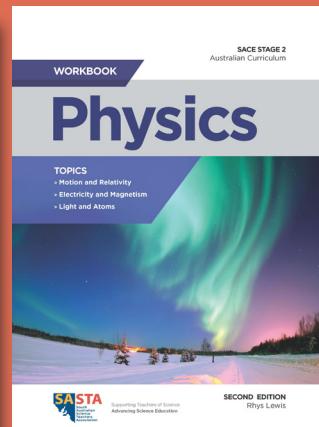
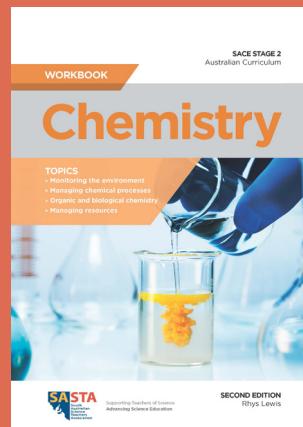


ALL NEW

**Biology &
Chemistry
available now**

**Physics available
for pre-order**

\$59.00 each



SACE Stage 2

SASTA is pleased to announce the arrival of the Second Editions of our workbooks for Stage 2 Chemistry and Physics.

Some of the features of the second edition workbooks include:

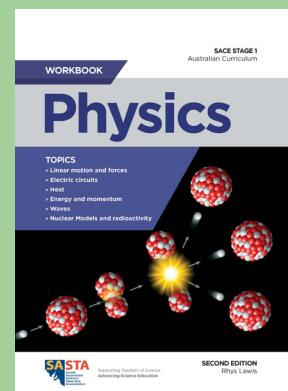
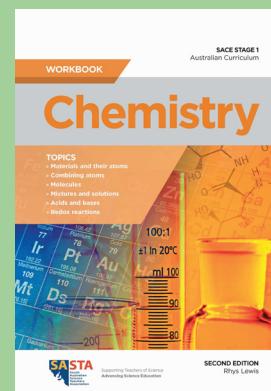
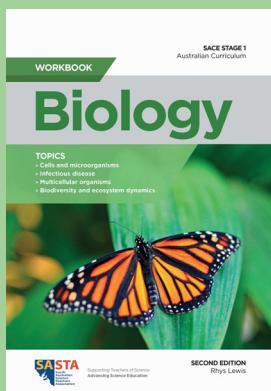
1. The content has been updated to match the most recent subject outline
2. Design and layout have been updated extensively for a neater and more consistent look throughout the book
3. Hundreds of new questions have been added that were not featured in the first edition
4. The book now features questions that assess Science as a Human Endeavour (SHE)
5. All explanations have been made more concise to minimise the time taken to grasp the concepts
6. Most images have been updated. Around 300 high quality illustrations feature in the new edition
7. All formulae have been explored using useful examples that incorporate real-world applications
8. The colours have been brightened and softened in different sections for easier reading and interpretation of the diagrams
9. Solutions have been reviewed and simplified in some areas
10. The number of questions supplied for each concept has doubled and, in some sections, tripled and quadrupled to reinforce student understanding
11. Solutions have been written more concisely for simpler absorption by students
12. There is a deeper focus on the use of prefixes in physics (milli, m, mega, M, kilo, k, giga, G etc) in questions which better prepares students for the end of year exam
13. Many more higher order thinking questions added to stretch high achieving students
14. Enough questions have been provided for each concept that a teacher can set 30-60 minutes worth of questions each lesson for students to complete.

View sample pages and order online at
<https://www.sasta.asn.au/resources>

SACE Stage 1

SASTA's Stage 1 workbooks cover all topics outlined in the SACE curriculum in an easy to read format with colour illustrations and diagrams throughout.

- Over 300 full colour illustrations and diagrams
- Over 250 problems with worked solutions
- Questions range from simple to challenging
- All questions are mapped to the new performance standards
- Topic test for each chapter.



\$54.00 each

Available from [sasta.asn.au](https://www.sasta.asn.au)