Biology Educators' Association of New Zealand
Te Rōpū Whakaako Koiora o Aotearoa

Term 2 2020 Newsletter

web: beanz.org.nz email: info@beanz.org.nz

Kia ora BEANZ. Great to hear from so many Biology and Science teachers out there who are thriving and finding innovative ways to support student learning online. This certainly is a time where we are developing new skills and methods of delivery. There seems to be a range of resources and online platforms offering material, the task itself being to discern what you will pick up to support your learners. Amid our successes, there are also disruptions and challenges for us to face. We have had cancellations and postponements of many of our annual events and professional development opportunities. Our focus on the current review NCEA achievement standards has also been partially sidelined as we have put our minds to responding to online learning. As new information is released we will continue to encourage you to stay actively involved in the process.

We want to take the time to remind you that BEANZ is continuing to provide support via its Regional Representatives Network. Keep an eye out for invitations to join online forums for specific standards and for online teaching and learning. We are aiming to increase the number of online BEANZ meetings available throughout the year. If you or your department would like tailored support let us know. We are here to help. BEANZ is also pleased to announce that we are able to offer a research scholarship for 2021 and that our latest set of examinations are available for purchase online.

Want help with a specific standard, online delivery or content?
- *Request to join / or opt in to our tailored online meetings*
- *Contact your regional representative directly (directory available on the BEANZ website)*
- *Access our exams for purchase*
- *Access our online material housed on the BEANZ site*
- *Access the latest updates for NCEA on TKI http://ncea.tki.org.nz/*

Interested in Biology related research? Have an idea in mind?
Apply for the BEANZ 2021 Research Scholarship.

Any other queries or ideas to share with your fellow biology teachers?
Contact: biologynz@gmail.com

We work best as an association when we come together to support each other. Continue to share your expertise and to encourage each other.

Kia kaha, ngā mihi nui
Chantal Hillier
President
Biology Educators Association of New Zealand

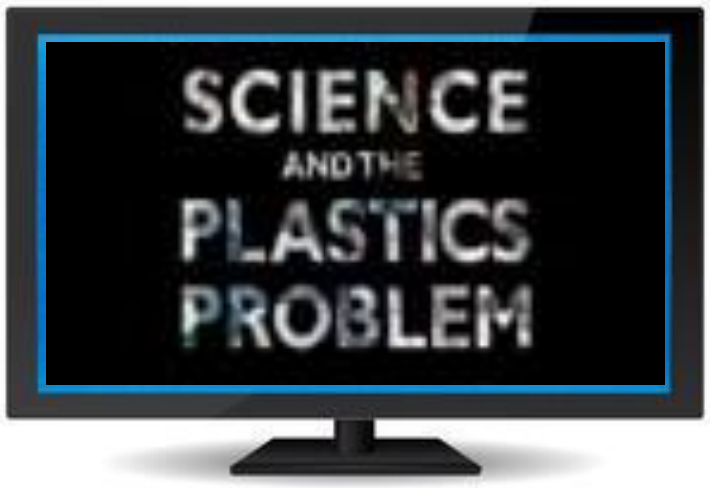
SCIENCE AND THE PLASTIC PROBLEM FILM

Filmmaker Shirley Horrocks and Glenda Lewis are making a series of mini-documentaries that follow the work of the PM's Chief Science Advisor, Professor Juliet Gerrard.
This first one, on plastics, was launched at Government House in December. It features Dame Jane Goodall, and the PM, of course, who receives more letters from school children on plastic than any other topic!

Science and the Plastics Problem https://vimeo.com/377413439

The Ministry of Business, Innovation and Employment has transcribed the content of the film on their site: https://www.mbie.govt.nz/about/news/science-and-the-plastics-problem/

The next one will be on cannabis, and definitely should be viewed by teachers and students. It involves science, medicine, genetics, psychology of human behaviour, law, etc.



BEANZ formal statement regarding the current review:

BEANZ has a long-standing and constructive history of working with New Zealand Science teachers and the Ministry of Education. All subject associations were made aware last year of the proposed changes that we face with specialist subjects as well as the realignment of Level 1 science standards. As we represent the membership of BEANZ we are reluctant to put forward views that give voice to only a small number. Due to the difficulty of accurately gathering membership wide data in the time frames required we are not putting forward an association response to the proposed changes and instead have advised all members to respond through the official channels as the review rolls out.

BEANZ appreciates the effort that the Specialist Expert Groups and the Ministry of Education have put into developing the framework for the current review of NCEA and related achievement standards.
Our goal is to continue to encourage and support BEANZ members to give feedback through Ministry directed channels at these critical stages in the process to effectively assist the Ministry of Education to optimise the proposed framework.
We thank all members of BEANZ who have taken the time to meet with their departments and regional groups to discuss the current framework, and have taken the time to provide their personal and individual perspectives to the Ministry of Education.

While we understand that we are all learning about this process as it unfolds, and the potential tensions that this may cause, we continue to strongly encourage science teachers to have a constructive voice and take advantage of all the opportunities to provide their feedback.

The Ministry has placed on hold most of our sector engagement work through the NCEA Review and, in particular, the Review of Achievement Standards (RAS) to support the Government's efforts to stem the spread of COVID-19.

They have provisionally extended the closing date for the public engagement on the NCEA Level 1 provisional subject list to 20 June 2020, from 20 April originally.

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https://consultation.education.govt.nz/ncea/ras-provisional-subject-list/

To keep up to date on the review of achievement standards visit: https://conversation.education.govt.nz/conversations/ncea-review/review-of-achievement-standards/

Biology Educators' Association of New Zealand (BEANZ)

Research Scholarship 2021

The BEANZ Research Scholarship is available to a practising New Zealand Biology teacher to conduct research into a relevant and current aspect of Biology of national benefit to Year 7 – 13 Biology teachers.
The research findings will be summarised in a written report and presented at a national level science educators' conference. Depending on the research topic chosen, the report may provide material that can form the basis for the annual BEANZ workshop.

Possible topics:

- Using a range of local Biology contexts/issues to develop meaningful science programmes for Year 7 – 11 Science.
- Teaching biology-focussed socio-scientific issues such as: responding to biosecurity threats e.g. pest control; gene editing in health care; building a marina; using GMOs.
- How to effectively incorporate digital technology into Biology programmes.
- Improving Biology teaching through culturally responsive teaching practises.
- Or suggest your own topic.

Who may apply?
Any Biology teacher who:

- Is a specialist Science teacher of years 7 - 13 experienced in teaching Biology classes (includes Head of Department and Intermediate teachers).
- Is a registered teacher in a permanent full or part-time position (at least 0.6 FTE), holding a current Teaching Certificate and employed by the Board of Trustees of a New Zealand school.
- Has taught the New Zealand Curriculum in the Science Learning Area for a minimum of 5 years.
- Will disseminate their research findings and is willing to take a role in BEANZ, either locally and/or nationally, for the following 2 years (2022-2024) with support from BEANZ, will disseminate the findings from the research.
- Is a New Zealand Citizen, or the holder of a New Zealand Residency permit.
- Is a member of BEANZ (either individually or through their school).
- Current BEANZ exec members may not apply.

The scholarship fund
The Scholarship fund is available as a result of BEANZ receiving Networks of Expertise funding to enable the association to support and improve Biology teaching practice. The focus is on building teacher capability at regional and national levels. The scholarship provides up to $20,000 (incl GST) for your school to cover release time taken over a maximum timeframe of one year and up to $2000 to cover expenses incurred in carrying out the research.
When can the research project start?
The scholarship can be taken up any time from the commencement of Term 1 2021. The report must be completed by 30 November 2021.
Applications close on Friday 3rd of July 2020 – See website for application form: www.beanz.org.nz

2020 BEANZ Level 3 Biology Practice External Exams

Thank you for your support and contribution in helping us to continue producing this resource; by teachers, for teachers. It has now been produced for 16 years.

The BEANZ NCEA Level 3 Biology Practice External Exams 2020 package includes:

- Assessment Schedules (with suggested grade boundaries)
- Files are sent as WORD documents
- Two versions:
- **Traditional –** The original version of the BEANZ practice exams, rich in resource, depth and length of questions. Teachers have the flexibility to focus on particular questions, sections and contexts by editing this to suit their learner.

Each paper in the Traditional version is NOT expected to be done as a whole one-hour exam.

- **Lite –** A trimmed down version of the Traditional one, which will more closely reflect the expected length and content of past NZQA Examinations.

Ordering is a 2-stage process:

- Funds paid into the BEANZ account.
- Order and Invoice form emailed to biologynz@gmail.com

NB. The exam will be emailed to the person who emails in your order. It will be attached to a "reply" email. (If that person is your office, finance person or lab technician, they will receive the exam.)

Cost	**$ 92.00 (inc GST)**
Expected delivery	Late Term 2 (Do not use BEANZ Exams as a mid-year exams)
Delivery method	By "Reply" email (via Google Drive Link). Please ensure the person who emails in the order is the person to whom the exam should be delivered.

BEANZ 2020
Invoice & Order Form

Biology Educators' Association of New Zealand
Te Rōpū Whakaako Koirora o Aotearoa

Transfer of funds to BEANZ Account

Organisation	**Biology Educators Association of New Zealand (BEANZ)**	
Bank	ASB Bank	
Account no	12 – 3143 – 0168197 – 00	
GST	126 – 203 - 624	NB: BEANZ is GST Registered
Email	biologynz@gmail.com	

Download an A4 copy here

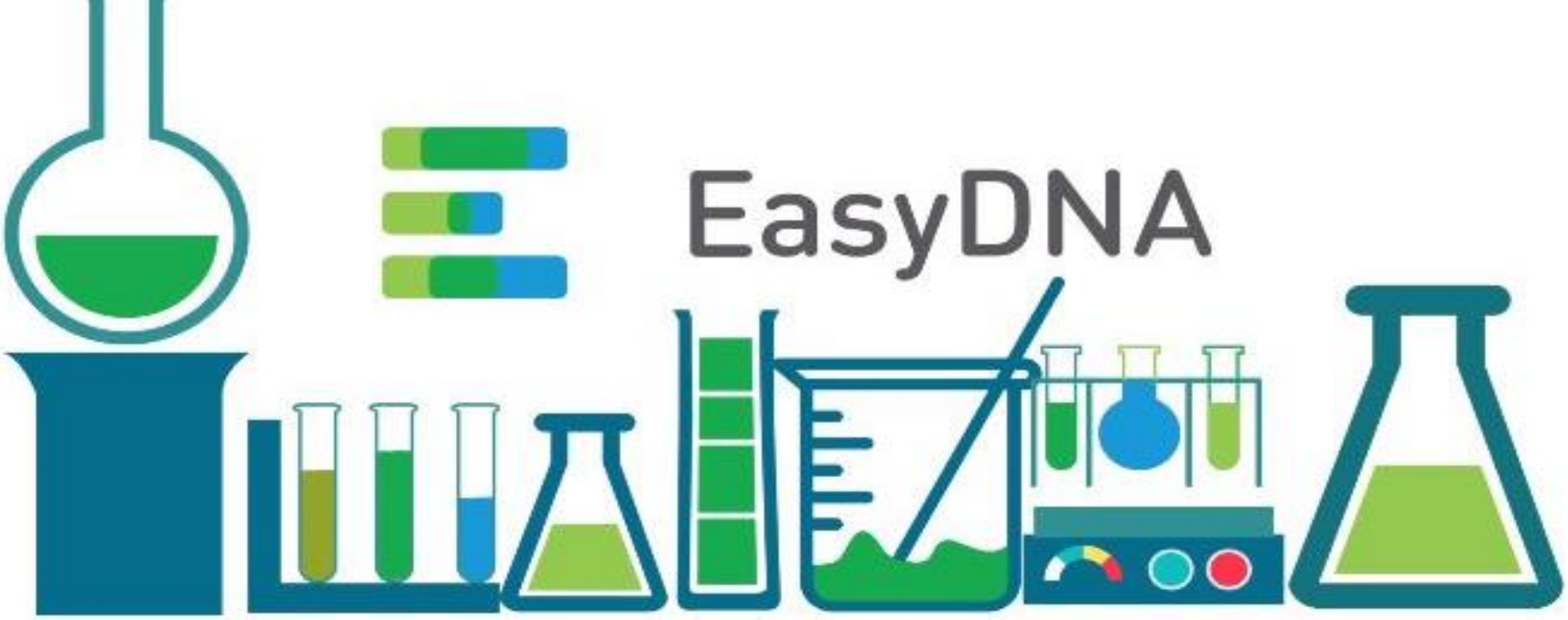
Add your school name so that we can recognise 'your' payment. Do NOT use initials (eg. ths, wghs, bhs, ccoll).

Email your order to the following email address: biologynz@gmail.com

Please use your school's FULL name in the email subject line.
eg. Christchurch High School BEANZ order.
A Google Drive Link with the exams will be emailed to the person who made the order OR the email address given below (please print the email address clearly, if different from the person making the order). This form doubles as an invoice, please fill up the form when you submit your order.

Name of school & address	
Ref/Order No	
Name of person ordering	
Email address	
Date of payment	

Resources ordered	Amount
BEANZ Level 3 Biology Practice Exam 2020	$ 80.00
GST (15%)	$ 12.00
Total & Amount owning	$ 92.00



Honey, I'm related to Genghis Khan': the hype around ancestral DNA testing

By Nic Rawlence
University of Otago

Quite frequently, you will hear me exclaim to my kids 'You can't say that!' or 'There's no evidence to support that', before I throw my hands up in exasperation. Despite the genomic revolution having swept through science and the popularity of testing for ancestral DNA, there is still a lot of hype and misconception surrounding the field. So, what is the hype and should we be concerned?

Ancestral DNA

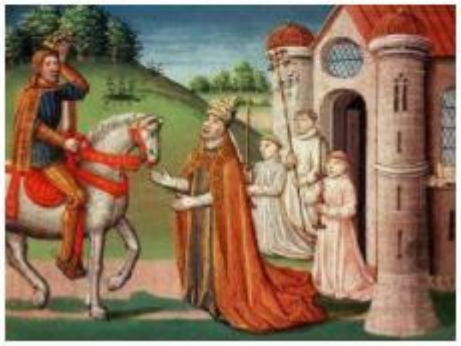
Ancestral DNA doesn't deal in deep time. Rather, it's limited to the past 500 years, which is pretty much the limit of conventional family history research. In New Zealand, the company EasyDNA will provide ancestry DNA testing for around $500. Similar overseas outfits include AncestryDNA, 23andMe, MyHeritage, and FamilyTreeDNA. So, how does it work? These companies get you to spit in a tube or swab your mouth with a Q-tip and send it away. From that sample, they sequence your DNA, and about two weeks later you get a summary 'revealing' your family history and DNA relatives. It's that easy. But what's the catch?

Daughters of Eve and Sons of Adam

In each of our cells we carry our very own genetic blueprint. This genetic blueprint also represents the culmination of a long journey that started in Africa, when modern humans started to colonise the world around 150,000 years ago. Read the strings of DNA letters that make up our genetic code correctly and you can reveal this long lost journey as easily as reading the pages of your favourite book.

Large international projects like *Africa to Aotearoa: The Longest Journey*, *The Genographic Project* and *Oxford Ancestors* use this genetic blueprint to track humanities journey around the world. Scientists use the mitochondrial genome, (inherited only through the female line), and the Y chromosome, (passed down from fathers to sons), as well as more commonly genome sequencing, to look into this exodus. Known as *Daughters of Eve* and *Sons of Adam*, these mitochondrial and Y chromosome lineages can narrow down one's genetic origin in deep time to a broad geographic region, tens of millennia ago.

My mitochondrial DNA says I'm T1a1, thought to have derived in the Near East around 25,000 years ago. My Y chromosome says I'm R-M207, and hail from Eurasia, possibly around the same time as T1a1. This is the extent of the information provided from taking part in *The Genographic Project*. Combined with ancient DNA however, these techniques are becoming an increasingly powerful tool in tracking human migrations and cultural evolution, like the transition from hunter gatherer to farming societies, through space and time. The latest iteration of *The Genographic Project* can now calculate the amount of Neanderthal DNA we carry in our genomes. But what can DNA tell us about our more recent ancestry?



Go back enough generations and millions of people of Asian and European descent are related to Genghis Khan (top) and Charlemagne (bottom, on horse), respectively.

Expect the unexpected

Ancient DNA showed this male skeleton found under a carpark in Leicester in England was King Richard III and that there was potentially a false paternity event in the male line leading to the monarch. The lure for many people is that while historical records may not tell the truth, DNA does not lie; that is why DNA is such a powerful tool. Take my colleague for example, who was recently involved in using ancient DNA to show that the male skeleton found under a carpark in Leicester in England was King Richard III. My colleague frequently jokes that he had to leave the country because the ancient Y chromosome DNA indicated that there was potentially a false paternity event in the male line leading to Richard III. None of the Y chromosomes of supposed living descendants of paternal relatives of Richard III matched the monarchs. The upshot, depending on when and in which line this false paternity event happened, either Richard III or alternatively the entire Tudor dynasty may not have had a claim to the throne of England. This is not surprising, given the average false paternity rate is usually between 1-2%. A more recent example is the woman who undertook ancestral DNA testing and discovered her father had been switched at birth. But what about more outlandish claims. Can these be believed?

Honey, I'm related to Genghis Khan…

Go back enough generations and millions of people of Asian and European descent are related to Genghis Khan (top) and Charlemagne (bottom, on horse), respectively. And Charlemagne, the Celts, Vikings and the Saracens. Ancestral DNA testing is big business and like most things you see on TV, you should never let the truth get in the way of a good story or a marketing ploy. I've been on both sides of science and the media, so I have developed a knack for spotting when data is overstretched.

Some companies, as revealed by Adam Rutherford of the BBC's Inside Science radio show, (who is a geneticist by trade), have outlandishly claimed that they can reveal the precise location of the village your ancestors lived in millennia ago, or historical genius matches, whereby you are told how many tens of millennia ago your mitochondrial and Y chromosome lineages diverged from famous people such as Queen Victoria, Charles Darwin or Abraham Lincoln.

Just remember, that you have two parents, four grandparents, eight great-grandparents, and so on. Go back far enough and everyone is related. I, like Adam Rutherford, and other New Zealanders whose ancestors emigrated from Europe, will no doubt be related to Charlemagne. As Professor Mark Thomas from University College London describes it, these ancestral relationships may as well be described as "homeopathic" because the genetic signal has been diluted so much through the generations. So how do we make sense of our ancestral DNA results and abandon all the hype and marketing?

Befriend your local geneticist

Geneticists are actually more common than you would think. There's more than two in my extended family. Get a geneticist to talk to your local genealogy group about what family history questions are testable with ancestral DNA. Watching the current series of the *DNA Detectives*, (or as we call it, *Daddy rants at the TV*), there are cases where genetics expertise would be beneficial to viewers in explaining ancestral DNA results, such as visually mapping genetic results onto a genealogy.

A few of the many examples include singer Stan Walker's 0.1% Native American DNA, (cue homeopathy compared to the 1.5-2% Neanderthal DNA in general that is present in our genomes except those of sub-Saharan African descent), possibly a reflection of shared Native American and Southeast Asian/Oceanian ancestry during the human exodus Out of Africa or more recently after European arrival in Polynesia; Jacinda Ardern's Canadian DNA relative Whitefeather who is genetically so similar they could be sisters; or why so many of the well-known kiwi's DNA relatives are in America.

Rather than a lost Polynesian tribe of Brazil, the Botocudo ancestry probably reflects Polynesian DNA entering the genomes of indigenous Brazilians through the 19th Century slave trade.

More amusing was a family friend whose ancestral DNA results indicate that she is related to the lost Polynesian Botocudo tribe of Brazil, (cue marketing ploy).

Rather, ancient DNA research suggests Polynesian DNA entered the genomes of indigenous Brazilians through the 19th Century slave trade, so the family friend's genetic relationship to Brazil is via a common ancestor potentially many generations ago in Polynesia.

Just remember, the genetic matches you get using ancestral DNA are only as good as the database each company is using. There is a reason why you have a lot of 'cousins' in the US because that is where the majority of people using these testing companies are from. People should choose a company where you have the greatest likelihood of a match with DNA relatives, which brings me to another point.

DNA does not make sense unless in the light of family history

You are not your genetic code, and DNA is not the be all and end all. Just as we do in reconstructing prehistoric ecosystems, we need to use all the tools in the tool box. In describing extinct species, scientists use a combination of ancient DNA, morphology, (shape of bones), and ecology. Likewise, ancestral DNA does not make sense unless it is viewed alongside family history and should not be used as a substitute for historical detective work. In the *DNA Detectives*, the family history of famous kiwi's including Antonia Prebble, Miriama Smith and Sir John Kirwin could just have easily been revealed through historical legwork and not DNA. Our ancestry and family trees are a mess; they are not nice tidy trees, rather a thick interlaced bush. Only by using all the available tools can we begin to reliably reveal hidden family mysteries.

There are two teacher scholarships up for grabs.

NZIBO Teacher Scholarships available! 2020 Easter school break.

Gain hands on laboratory skills in

- Invertebrate biology dissection, ethology
- Botany - plant classification, plant sectioning, floral form and function
- Microscopy - microbiology aseptic technique, histology,
- Biotechnology - gel electrophoresis, profiling
- Ecology – island, marine and freshwater sampling and much more!

This will enable you to attend the NZIBO training and selection camp during the Easter Holidays 2020. These scholarships will include; transport to and from the camp in Auckland, accommodation and meals at the camp , full participation in all of the learning, field trips and labs (just like the students).

You will meet academics and teachers from around NZ and enjoy a wonderful professional development opportunity with the chance to work with passionate biologists; students, scientists, and university staff.

To apply ·write one paragraph about yourself with a photo, suitable for inclusion in a newsletter about the camp and a description of your reasons for wanting to come to camp – there are two legs of 4 days each (specify first or second leg of first 8 days of the holidays, after Easter Sunday) Visit nzibo.org.nz for more details about NZIBO and check out our Facebook page – NZIBO – for a snapshot of what camps 'look like' We are really excited to be able to share this event with a wider circle of keen Biology teachers. It is a tremendous learning experience and lots of fun.

Email NZIBO secretary : Dr Heather Meikle h.meikle@pnghs.school.nz

NEW ZEALAND
INTERNATIONAL BIOLOGY OLYMPIAD

The accessibility of NZIBO to all our kiwi kids depends on **you!** If a teacher can connect a capable student to the NZIBO team – we can pick it up from there. The work is online, supported by young uni students on Facebook and connects like-minded tauira with each other across the country. Teachers can know that their very bright, self-motivated tauira are in good hands – and can gain support from mentors on the extensive NZIBO team.

Nā tō rourou, nā taku rourouka ora ai te iwi

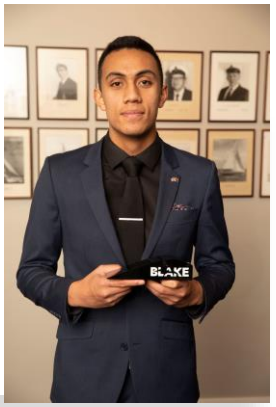
This summer, over 300 students have put in an average of almost ten hours per week working on Biology tutorials from Sept - February! These kids just LOVE their Biology! They are working towards selection to represent their country at an international event in July.

The International Biology Olympiad is a meeting of talented and motivated students from all over the world. They compete with exams and extended practicals in biology for Gold Silver and Bronze medals – and every year New Zealand Aotearoa bring home at least THREE medals!

The exam is in the first week of March – but that is just the START of the excitement. About 25 top students who have excelled in the March exam meet in Auckland for an action packed ten day Biology extravaganza. The training camp has tauira ma completing three extended labs per day – morning, afternoon and even evening – honing dissection skills, microscopy, plating microbes, running gels – or out on islands completing 5 minute bird counts, snorkling to complete underwater surveys or completing actograms or ethograms while watching birds, fish or invertebrates. It is a biology feast! No wonder NZ Aotearoa boxes above its weight in the international medal cunt – our Kiwi kids learn their biology from more than just books and websites!!!

Come and meet us at SciCon – join us on the teacher scholarship – get your bright students involved

Do you know an outstanding young New Zealand leader?



Nominations are open for the 2020 BLAKE Leader Awards and we're looking for young New Zealanders (aged 13-20) to be nominated for the BLAKE Youth Award.

Sponsored by Westpac, this award recognises and celebrates rangitahi whose unique leadership is creating a positive impact on a sustainable future for Aotearoa New Zealand - socially, culturally, environmentally or economically.

Meet last year's winner Okirano Tilaia, whose outstanding leadership at just 17 years of age, spanned community, school, sport and culture. This passionate young man of proud Samoan heritage was selected for his strong voice for youth, Pasifika and the environment.

CRITERIA

- Demonstrate outstanding leadership.
- Create an impact and help contribute to a sustainable future for New Zealand - socially, culturally, environmentally or economically.
- Ability to clearly communicate a vision and inspire others.
- Display some or all of the characteristics that Sir Peter Blake himself demonstrated, including: belief in achieving extraordinary things; the initiative to pursue an idea; a desire for constant improvement; trusting and empowering teammates; integrity; and having fun.
- Demonstrate a commitment to New Zealand (and be a New Zealand citizen).

Winners will be announced at the BLAKE Awards dinner on Thursday 10 September 2020 in Auckland. **Nominations close Sunday 22 March 2020.**

BEANZ EXECUTIVE

Position	Name	Email
President (NZASE Representative)	Chantal Hillier	chantal.hillier@gmail.com
Senior Vice President	Sharyn Varcoe	sharyn@oxford.school.nz
Junior Vice President (Regional Rep Liaison)	Ian Reeves	rvi@papanui.school.nz
Treasurer	Peter Sutton	peters@pcmedia.co.nz
Secretary (minutes)	Libby Caygill	cae@cashmere.school.nz
Website Coordinator	Ben Himme	benjaminhimme@gmail.com
Exam Coordinator	Kenneth Loh	kloh@ormiston.school.nz
Newsletter	Holly Wilson	hwilson@otc.school.nz
Curriculum Development	Pru Casey	pru.casey@gmail.com
Curriculum Development	Erica Jar	erica.jar@solwaycollege.school.nz
Curriculum Development	Penny Daddy	daddypenny@ngatawa.school.nz
Tertiary Representative	Nic Rawlence	nic.rawlence@otago.ac.nz

Nominate here: https://blakenz.org/blake-leader-awards

BEANZ