



NIWA

Taihoru Nukurangi

Proud sponsors of Regional Science and Technology Fairs

NIWA Waikato Regional Science & Technology Fair

15th & 16th August 2019

Hamilton Gardens Pavilion, Cobham Drive, Hamilton East

Thursday 15 August	8.30am–9:00am	Exhibit set up
	9.00am–11.30am	Judging with students present
	11.30am–3.30pm	Judging continues
	3:30pm–6:00pm	Public viewing welcome
Friday 16 August	9:00am–2:00pm	Public viewing welcome
	2:00pm	Removal of displays
Tuesday 20 August	7:00pm	Prize giving ceremony at St. Paul's Collegiate School

An event co-ordinated by:

Kiwanis Club of Westside Hamilton and WSTA



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SPONSORS

The organising committee wish to acknowledge the following organisations for their valued financial contributions in ensuring the success of the 2019 NIWA Waikato Regional Science & Technology Fair. Thanks must also go to the schools and other organisations that have generously allowed the release of staff to form the judging and stewarding teams.

PLATINUM

National Institute of Water and Atmospheric Research (NIWA)

GOLD

Babbage Consultants
DairyNZ
Hill Laboratories
Waikato Regional Council

Livestock Improvement Corporation
The Electrical Training Company
University of Waikato

SILVER

Engineering NZ
Kiwaniis Club of Westside Hamilton
SciPad

Tatua Co-operative Dairy Company Ltd
WINTEC
WSTA

BRONZE

NZ Institute of Chemistry Waikato
Morphum Environmental

Science Awards Trust

SPONSORS

Baking Research Trust
Dairy Goat Co-Operative NZ Ltd
Geoscience Society of NZ Waikato
NZ Microbiological Society
NZ Society of Soil Science
NZ Statistical Association & Statistics
NZ

Sociological Association of Aotearoa
NZ Institute of Food Science and
Technology Waikato
NZ Institute of Agricultural Sciences
Department of Conservation
WEL Energy

2019 WAIKATO SCIENCE FAIR COMMITTEE

2019 Waikato Science and Technology Fair Committee – Welcomes You

On behalf of the Waikato Science and Technology Fair Committee, I would like to extend a warm welcome to all the exhibitors. Your enthusiasm for science makes the event a pleasure to organise. I wish you the best of luck with your exhibit.

To the teachers, parents and friends who have helped the students with their exhibits, we thank you. We thank you for the time, support, encouragement and patience you have shown over the months of preparation for the fair. You are extraordinary and are to be commended for your efforts.

To our sponsors, thank you for your generous support. We are once again, extremely thankful to our premier sponsor, NIWA, without whom we would struggle to put on a fair. Special thanks also to our major sponsors, Hill Laboratories, University of Waikato, Dairy NZ, The Electrical Training Company, Babbage Consultants, Livestock Improvement Corporation and Waikato Regional Council. To all our sponsors, we greatly appreciate your support and we hope to continue our partnership into the future.

The committee would also like to acknowledge and thank everybody who has helped to make this fair possible. The judges who freely gave their time and expertise to support and encourage our young scientists. The Waikato secondary schools' science technicians who staffed the registration desks with care and professionalism.

Finally, we hope you have an enjoyable fair and we look forward to seeing you again next year.

Kelvin Hogg

Chairperson,

Waikato Science and Technology Fair Committee

2019 Waikato Science and Technology Fair Committee

Chairperson: Kelvin Hogg Secretary: Nick Smith Treasurer: Harriet Reed-Hadley

NIWA representative: Tracey Burton Judging coordinator: Anne Pouwels

Committee members: Alec McGowan, Fiona Murphy, Sarah Bogun, Julia Liefing, Kirsty Mills



Proud sponsors of Regional Science and Technology Fairs

MAIN SPONSOR MESSAGE

A very warm welcome to the 2019 NIWA Waikato Science & Technology Fair.

It's a great pleasure for NIWA to support this outstanding event once again, and we congratulate all the students, parents, teachers and supporters who have worked so hard to ensure its success.

NIWA Science & Technology Fairs are a wonderful opportunity for students to showcase their talent and enthusiasm for science, and to gain recognition for their excellence and innovation. Across the country, thousands of students have been involved in researching, constructing and presenting exhibits. Participation is on its own a powerful learning tool, but above all else they should be fun.

Naturally, NIWA has a vested interest in nurturing a passion for science and technology among young New Zealanders. Enhancing knowledge in NIWA's key areas of scientific focus – the atmosphere, the ocean, and freshwater – is critical to the sustainable growth of New Zealand as a nation. We need fresh enquiring minds to maintain this momentum. A career in science and technology is as rewarding as it is important – and right here is where we hope a spark may be lit.

NIWA is the main sponsor of the Waikato, Auckland City, South & East Auckland, North Harbour, Bay of Plenty, Wellington and Canterbury-Westland Science and Technology Fairs. These events form part of our long-term commitment to enhancing engagement with science and technology by young New Zealanders.

Thank you to the organising committee, Kiwanis, judges, schools and other sponsors for your commitment and support in promoting the NIWA Waikato Science & Technology Fair. Without you, this exciting event simply wouldn't happen.

Tracey Burton

NIWA Science Fairs Co-ordinator

For more information on NIWA visit: www.niwa.co.nz



KIWANIS CLUB OF WESTSIDE HAMILTON

Hamilton's Westside Kiwanis Club is proud to continue their involvement with the National Institute of Water and Atmosphere Research (NIWA) Waikato Regional Science Fair.

Kiwanis International was founded in 1915 and has more than 600,000 members in 92 countries throughout the world. Our primary focus is to support children and young people and in a typical year, Kiwanis invests more than 6.2 million hours and US\$100 million in communities around the world.

The Kiwanis Clubs of New Zealand have supported Science Fairs nationwide since the 1960s.

We believe that given encouragement and the proper facilities to expand their enquiring minds, today's children will be instrumental in making tomorrow's world a better, safer, and more enjoyable place to live.

Science Fairs such as this give these young people the ability and enthusiasm to discover ways of providing clean water, better medicines, more nutritious food, safer methods of transport and better ways to live in harmony with the environment around us.

I would like to congratulate NIWA for the generous and ongoing sponsorship. To the judges who have put in many hours of careful discussion and observation before making their decisions, and the many teachers and parents who have helped, encouraged and given their time and energy, we offer well done and thank you. Also to the many students who have produced such a wide variety of excellent displays, I say congratulations and thank you for the time and effort you have spent.

With all these groups and individuals working together we have produced once again a very successful and entertaining Science Fair.

Yvonne Joyness

President

Kiwanis Club of Westside Hamilton



WAIKATO SCIENCE TEACHERS ASSOCIATION (WSTA)

Waikato Science Teachers Association (WSTA) The Waikato Science Teachers Association (WSTA) is a group of passionate Science educators from across the greater Waikato region. The WSTA has played a key role in the 2019 NIWA Waikato Regional Science and Technology Fair.

The Science Fair is an opportunity for students to showcase their ability in Science. It challenges students to carry out some 'real world' science - the way scientists think and do Science. The WSTA is proud to be supporting students in our region excel in these endeavours. The WSTA is always impressed with the effort and scientific process that students display at the fair. It is always a delight to see the work our next generation of Scientists produce.

WSTA wish to congratulate all competitors who have completed a Science Fair project, especially those who have reached the NIWA Waikato Regional Science and Technology Fair.

Sara Loughnane

President

Waikato Science Teachers Association

Each year Science Technicians from around the Waikato help on the registration desk.
Thank you to:

Raewyn Keene – St. Paul's Collegiate School

Chris Lea – St. Peter's School

Pam Welch-Cropp – Waikato Diocesan School for Girls

Michelle Warner – Fraser High School

Emma Gray – Hamilton Boys' High School

Lisa Clay – Rototuna High School

PRIZE LIST

SUPREME AWARDS

1. Best in Fair: **\$800** cash award and trophy sponsored by NIWA, plus a ticket to the 2019 Kudos Awards dinner.
2. Runner Up: **\$450** cash award and trophy sponsored by NIWA, plus a ticket to the 2019 Kudos Awards dinner.

2019 NIWA SHIELD FOR BEST OVERALL SCHOOL

The supreme award, which aims to recognise the combined success of award winning students from within a school.

NIWA WORK EXPERIENCE SCHOLARSHIP

Additional to fair sponsorship NIWA is proud to offer a two-week NIWA Work Experience Scholarship for a senior student (aged 16 years or over) who has excelled in presenting an environmental project in the fair. This scholarship provides **paid work experience** in January 2020 at NIWA Hamilton. The winning student will be given the unique opportunity to work along-side NIWA scientists working at the forefront of NIWA science.

MAJOR AWARDS

These awards come with a cash prize:

\$200 for 1st place

\$100 for 2nd place:

- Best Scientific wall display (1st and 2nd)
- Best Year 7 exhibit (1st and 2nd)
- Best Year 8 exhibit (1st and 2nd)
- Best Year 9 exhibit (1st and 2nd)
- Best Year 10 exhibit (1st and 2nd)
- Best Year 11-13 exhibit (1st and 2nd)
- Best Technology exhibit (1st and 2nd)

CLASS AWARDS

For classes 1-14:

First Prize: **\$100.00**
Second Prize: **\$70.00**

Third Prize: **\$40.00**
Highly commended: **\$20.00**

For classes 15-20:

First Prize: **\$70.00**
Second Prize: **\$40.00**

Third Prize: **\$30.00**
Highly commended: **\$20.00**

SPECIAL AWARDS

1. NIWA Special Award for an outstanding exhibit related to water and/or the atmosphere.
2. NZ Statistical Association Special Award for the excellent application of statistical methods and reasoning.
3. New Zealand Soil Science Society Special Award for an outstanding exhibit that relates to soil science.
4. NZ Baking Industry Research Trust Special Award for the best use of flour or bakery products in a food related project.
5. New Zealand Institute of Agricultural Science (Waikato) Special Award for an excellent exhibit with an agricultural theme.
6. Dairy Goat Co-operative (DGC) Special Award for the best Year 7-8 Food Science & Technology exhibit.
7. New Zealand Institute of Food Science & Technology (NZIFST - (Waikato Branch)) Special Award for best Year 9-13 Food Science & Technology exhibit.
8. Sociological Association of Aotearoa Special Award for the best exhibit incorporating social sciences.
9. New Zealand Microbiological Society Mike Baxter Prize.
10. McGowan Special Award – Judges choice.

** Please note: all Highly Commended and Special awards are awarded at the discretion of the Judges.*

JUDGING PANEL

The judging panel consists of scientists from local industries and tertiary institutions.

Chief Judge

Tracey Burton

NIWA

Senior Judges

Liz Carpenter Living World

Dairy Goat Co-operative NZ Ltd

Michele Prinsep Material World

University of Waikato

Nick Body Physical World

Gallagher Group

Fiona Murphy Earth & Resources

SHGC - Hamilton / WSTA

Peter Burgess Inventions & Innovations

Gallagher Group

Roger Cox Senior Sciences

Wintec

Anne Pouwels Judges' Convenor

WSTA

Judging Panel

Anathea Albert

NIWA

Grant Anderson

LIC - Livestock Improvement Corporation

Shannan Bell

NIWA

Catherine Cameron

NZ Statistical Association

Amos Chua

Tatua Co-Operative Dairy Company

Jason Clague

Hill Laboratories

Juliet Clague

Lincoln Agritech Ltd

Amanda French

University of Waikato

Patricia Gleason

Wintec

Arie Graafhuis

Food Industry Health & Safety Consultant

Elizabeth Graham

NIWA

Shalini Guleria

University of Waikato

Allan Hardaker

University of Waikato

Nita Harding

DairyNZ

Chad Harland

LIC - Livestock Improvement Corporation

Caitlin Holm

Waikato Regional Council

Cherry Hu

Dairy Goat Co-operative NZ Ltd

Swati Jivanji

LIC - Livestock Improvement Corporation

Vanessa Leung

Fonterra – Hautapu

Thomas Lopdell

LIC - Livestock Improvement Corporation

Kieran M^cCahon

DairyNZ

JUDGING PANEL (CONT.)

Linda Peters	University of Waikato
Ngaire Phillips	Streamlined Environment
Mubashir Qasim	LIC - Livestock Improvement Corporation
John Richards	Engineering NZ
David Sanft	Etco - The Electrical Training Company
Johanna Schmidt	Sociological Association
Andrea Soanes	University of Waikato
Norm Stannard	Engineering NZ
Pamela Storey	Consultant
Karen Thompson	NIWA
Louise Tolenaars	DGC Dairy Goat Co-operative NZ Ltd
Mike Townsend	Waikato Regional Council
Martin Upsdell	NZ Statistical Association
Peter Vautier	Engineering NZ
Gwyn Verkerk	Consultant
John Waller	NZ Statistical Association
Erina Watene-Rawiri	NIWA
Kate Wilson	Intellectual Property Consultant
Marcus Wilson	University of Waikato
Rebecca Yeates	Morphum Environmental

ABBREVIATIONS FOR SCHOOL NAMES

School name	Abbreviation
Berkley Normal Middle School	BMNS
Cambridge Middle School	CMS
Fairfield Intermediate School	FIS
Hamilton Boys' High School	HBHS
Hamilton Christian School	HCS
Hamilton Girls' High School	HGHS
Hautapu School	HS
Hillcrest High School	HHS
Marian Catholic School	MCS
Matamata Intermediate School	MIS
Ohaupo School	OS
Peachgrove Intermediate School	PIS
Pirongia School	PS
Rototuna Junior High School	RJHS
Sacred Heart Girls' College	SHGC
Southwell School	SS
St. Paul's Collegiate	SPC
St. Peter's School	SPS
St. Pius X Catholic School	SPX
St. John's College	SJC
Te Awamutu College	TAC
Te Pahu School	TPS
Waikato Diocesan School for Girls	WDSG
Waipa Christian School	WCS
Whareorino School	WS

EXHIBIT CLASS: 1 – YEAR 7 LIVING WORLD

Sponsored by: TATUA CO-OPERATIVE DAIRY COMPANY LTD



	Name	Exhibit title	School
0101	Zoe ter Beek	Poo Power	BMNS
0102	Nathan Jensen	LED vs Halogen: Battle of the lights - Moth edition	BMNS
0103	Liam Stiles	What makes our fingerprints unique?	BMNS
0104	Ariel Wu and Pania Gallagher	Colour / Number	BMNS
0105	Olivia Billings	Waikato Soil Grow a Pansy	BMNS
0106	Logan Ismay	Growing Attraction	CMS
0107	Olivia Bredenbeck	Who's Poos?	CMS
0108	Oliver Rickett	Health Benefits of Garlic	HS
0109	Amanda Greenbaum	Does Tooth Decay Happen Overnight	HS
0110	Grace Parker	Sprig Colours	HS
0111	Xander Taylor	How Do Video Games Affect your Heart Rate	HS
0112	Eoin Kelly	Mighty Mushrooms	HS
0113	Neo Urlich and Kele Cuthers	Sand, Clay and Loam	MCS
0114	Tasya Brough	Changing Flavours	PIS
0115	Rachel Kim	Does Fat affect Taste	PIS
0116	Anab Hussein	Are You Creative	PIS
0117	Brendan He	"Let the memory live again" - music and the brain!	PIS
0118	Harlynn Samuels-Brown	Taste the Rainbow	PIS

0119	Sara Shakur	Does Colour Affect Taste	PIS
0120	Mia Begbie-Daniel	MIndset Matters?	PIS
0121	Usman Kamran	Bacteria Killer	PIS
0122	Mac Innis	Antimicrobial or Not	PS
0123	Paige Ryan-Gaylor	Crystal healing	PS
0124	Aidan Hodgson	Destriying Destructor	PS
0125	Nathan Whiteman	Can you Handle the Tooth?	PS
0126	Chloe Housley	Sweet As	RJHS
0127	Jana Hendrikse	Don't Be An Egg	RJHS
0128	Zak Hendrikse	I See the Light Which Type?	RJHS
0129	MJ Gatchalien and Melody Reyes	Rainbow Memory	SPX
0130	Anya Rae	Memory Boosters	TPS
0131	Paul Davey	Does Temperature Affect Cow's Milk?	TPS



Profitability. Sustainability. Competitiveness.

DairyNZ invests dairy farmers' money into a wide range of programmes, guided by a dairy industry strategy which outlines the commitments and goals we want to achieve as a sector.

DairyNZ's work includes research and development to create on-farm tools, leading on-farm adoption of good practice farming, promoting careers in dairying and advocating for farmers with central and regional government.

The Waikato Science and Technology Fair is one of six regional fairs that DairyNZ is sponsoring in 2019. DairyNZ is committed to recognising the talents of young scientists.

EXHIBIT CLASS: 2 – YEAR 8 LIVING WORLD

Sponsored by: DAIRYNZ



	Name	Exhibit title	School
0201	Mikaela Davidson	A Mouldy Problem	BMNS
0202	Aimee Steele	The Secret Life of Sushi	BMNS
0203	Lucy Steele	Tricks and Treats	BMNS
0204	Olly Hills and Jacob Chen	Carnivorous Competition	BMNS
0205	Katrina Waters	Are we Breaking up?	BMNS
0206	Kinnon Broekhuizen	Is There a Monster Lurking in Our Parks	BMNS
0207	Ella Cooney and Elise Paki	Plant Survival: Milk vs Coke	BMNS
0208	Liam Wells	What's in my Tank?	CMS
0209	Abi Stewart	A Plant's Favourite Drink	CMS
0210	Jasmine and Lily-Rose Osborn-Dunn	How Identical are we?	HS
0211	Hazel Cranfield and Renee Sweetman	The Power of Sun	MCS
0212	Finnula Giedt and Lara Lantieri	Did you just eat that?	MCS
0213	Cassia Lee	Memory	PIS
0214	Juwan De Soysa Vidanalage Sehansa Thewmi Soysa	Sherlock Phenomes	PIS
0215	Caydin Kirkham	Do Coloured lights affect our eyes?	PIS
0216	Adriana Katoa	Is Left Right?	PIS
0217	Aina Shehryar	DNA Busters	PIS

0218	Jackson Brough	Are your eyes playing tricks on you?	PIS
0219	Selah Ritchie	Catastrophic	PIS
0220	Asmaa Mohmamd	Blue Grow, Green Grow	PIS
0221	Eva Pereira	Old Dog New Tricks?	PIS
0222	Aylee Gane	"Man'ure gonna wanna read this"	PS
0223	Caitlyn Messer	To Rise or Not to Rise	RJHS
0224	Alannah Wrigg and Meg Hart	Producing Plants	RJHS
0225	Bella Potter and Milan Nordstrom	Musicians and Athletes	SS
0226	Oliver Heeley and Liam Fairweather	Left or Right, Memory Bright	SS
0227	James Loughnane	Sycamore Seed Dispersal	SPS
0228	Amelia Keir	How clean is YOUR kitchen bench?	SPS

EXHIBIT CLASS: 3 – YEAR 7 MATERIAL WORLD

Sponsored by: **NZIC – WAIKATO BRANCH**



	Name	Exhibit title	School
0301	Amy Wright and Charlene Theron	Whatever Floats Your Boat	CMS
0302	Spencer Shortt-Smith	A Battery That Makes Cents	CMS
0303	Miriam Ballard	This is War	CMS
0305	Ashwin Bhorkar	Dazzling too Dull	PIS
0306	Andrew Kim	What is the optimal ratio of salt to water in a salt water battery?	PIS
0307	Alex Monson	Filtering Water through Different Materials	PIS
0308	Ishaan Patel	Money Laundering	PIS
0309	Sumaiya Azfar	Why Onions Make Us Cry And How Can We Make it Stop	PIS
0310	Zaria Uluakiola	Splitting Water	PIS
0311	Anahera Crawford	Which Type Of Chocolate Melts the Fastest	PIS
0312	Zara Brassington	Is ECO Really ECO	PIS
0313	Kirby Lacson	Removing Rust	PIS
0314	Oliver Herbert	Solar Power	PS
0315	Libby Haynes	Blind Baking	PS
0316	MacKenzie Whyte	Cuppa Tea?	PS
0317	Chloe Housely	Sweet As	RJHS
0318	Jana Hendrikse	Don't Be an Egg	RJHS

0319	Ezra Gage-Brown and Tamsyn Monrad	Kombu What?	RJHS
0320	Petra Koolen	Something in the Water	RJHS
0321	Martha Heeley	Hot and Bothered	SS
0322	Fiona Paul	An apple a day	SPX



Babbage Consultants was established in 1937 by the great grandson of Charles Babbage, the inventor of the Difference Machine, an early computer and its design was one of the great scientific engineering feats of the 19th century in the world.

Babbage's head office is located in Auckland and provides engineering and design services across multiple engineering disciplines, which also includes a large Architecture division.

Babbage is a New Zealand owned business and is the leading project management consultancy of large capital projects in the Dairy industry with the PM Division office based in Hamilton. Babbage has successfully managed the majority of the large projects for the dairy industry throughout Australasia.

This division has received several top national awards for excellence in project delivery and safety management of dairy capital projects and based upon excellent performance clients have retained us for repeat business when they have further major projects.

EXHIBIT CLASS: 4 – YEAR 8 MATERIAL WORLD

Sponsored by: SciPAD



	Name	Exhibit title	School
0401	Daniel Loy	How Ironic	BMNS
0402	Nicole Nelson	Watch Your Temper	CMS
0403	Brooke Spencer and Regan Leech	Crystals	CMS
0404	Dayna Anderson and Kaela Stanton	Caramelisation	HS
0405	Zhan Price and Benedict Doohan	The importance of washing your hands	MCS
0406	Danielle Lewis and Ashleigh Varghese	How can you reduce spray from shaken soda cans	MCS
0407	Jayne McPhillips and Lucy Allen	How to dye-naturally	MCS
0408	Jack Calder and Jay Benefield	How to prevent an apple from oxidising	MCS
0409	Marco Villegas and Yumeth Gamage	Which beverage affects our teeth the most?	MCS
0410	Joie Lin and Sophia Hall	Rotten teeth	MCS
0411	Rebekah Ward and Bianca Winstanley- Mounsey	Muffin Madness	OS
0412	Paige Keith	Rise or Fail	OS
0413	Rohit Gulla	Mpemba Effect	PIS
0414	Latoya Haimona	Winter Chills	PIS
0415	Lochlan Jackson	The Pains of Stains	PIS
0416	Cameron Watt	Eggsperiment	PIS
0417	Tia Merrilees	Refraction in Action	PIS
0418	Samirah Hussein	Cleaning Solutions	PIS

0419	Hugh Masters	Casein Racing	PIS
0420	Erika Piper	Is the Lightest Hottest	PIS
0421	Alexus Abraham	Identifying Different pH Levels In Water	PIS
0422	Tony Tay	Stain or Decay	PIS
0423	Thea Leifting	My Solution to Oil Pollution	PIS
0424	Muhammad	Mug or Teacup	PIS
0425	Caitlyn Messer	To Rise or Not to Rise	RJHS
0426	Sammy Cooke and Hannah Howard	Are Pineapples Trying to Kill You?	RJHS
0427	Malak Ibrahim and Colette De Clercq	Foodtastic!	RJHS
0428	Poppy Williams and Rylee Mardon	Oh Sugar!	RJHS
0429	Isaac Albery	Lootin' Gluten	SS
0430	Lily Jarrett	Plastered	SS
0431	Martha Newland	Stain-Ed	TPS
0432	Dione Poros and Charlotte Thomas-Carter	Stand Up To Onions	HS

EXHIBIT CLASS: 5 – YEAR 7 PHYSICAL WORLD

Sponsored by: **BABBAGE CONSULTANTS**



	Name	Exhibit title	School
0501	Olivia Wang	Rainbow Energy	BMNS
0502	Natalie Thomas	When Life Gets Blurry, Adjust Your Pinhole	CMS
0503	Philip Johnson	Are Childproof Containers Really Childproof	CMS
0504	James McIntosh and James Amos	What is the Best Way to Insulate?	CMS
0505	Isobella Oxton-Doubleday	Swim Drag	HS
0506	Daniella Ramos and Irish Lee	Which liquid contains the most voltage to power a digital clock?	MCS
0507	Naomi Martin and Jessica Ward	Beyond the Bubbles	OS
0508	Shania Holmes and Jaime Turner	Classroom Secrets	OS
0509	Krishna Patel	Cadbury vs Whittakers	PIS
0510	Emma Bowyer	How to create a rainbow with a prism and a torch..	PIS
0511	Rozhina Sharifi and Valerie de Vries	Powered Boats	RJHS
0512	Emerson Berry	What Weight?	TPS

EXHIBIT CLASS: 6 – YEAR 8 PHYSICAL WORLD

Sponsored by: **WINTER**



	Name	Exhibit title	School
0601	Amelie Harvey	Mugshots	CMS
0602	Liam Cornforth and Luka Dale	Is Gaming a Pain?	MCS
0603	Ryan Ingram and Saxon Winstanley-Mounsey	Purerehua Pitch	OS
0604	Jyne Eom and Ruby deWolf	Music Vibes	OS
0605	Bethany Embling	Perfect Pirouette	RJHS
0606	Mitchell Robinson	What a Hull	SPS
0607	Emma Coley	How do I attach my Dragon wings?	SPS



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Many of today's top scientists and engineers began their careers with a science fair project. An ability to think outside the box and a determination not to give up has formed the basis for some of the world's most remarkable scientific discoveries and are values at the forefront of the Waikato way of thinking.

The University of Waikato's Schools of Science & Engineering offers the next step in your journey. Our internationally recognised programmes in Biological Sciences, Chemistry, Earth Sciences, Engineering, Environmental Sciences and Physics will give you the skills to open doors anywhere in the world.

EXHIBIT CLASS: 7 – YEAR 7 & 8 PLANET EARTH AND BEYOND

SPONSORED BY: UNIVERSITY OF WAIKATO



	Name	Exhibit title	School
0701	Charlotte Valvoi and Jessie Armstrong	Shake it Up	CMS
0702	Hannah Goodwin	It's Raining, It's Pouring	CMS
0703	Ceana Burton	A Glowing Problem	CMS
0704	Niamh Hartley	How Long is the Day?	CMS
0705	Jumana Fouda	If the Sun isn't the Brightest Star What is and Why Don't We Get Light From It	PIS
0706	Ryan Leslie	SODS (Save Our Disposable Souls)	RJHS
0707	Katie Li	The driving force of all nature	SS
0708	Payton Hazelhurst and Aarushi Nanjappa	Da(n)m it	SPS

EXHIBIT CLASS: 8 – YEAR 9-10 LIVING WORLD

Sponsored by: **WAIKATO REGIONAL COUNCIL**



	Name	Exhibit title	School
0801	Hamish McKelvie	Using my Head to follow my Heart	HBHS
0802	Beth Clearwater	Breathable Waters	HGHS
0803	Bella Pye	Long live the flowers	HGHS
0804	Mehak Sidhu	Rock of ages	HGHS
0805	Beth Clearwater	Breathable waters	HGHS
0806	Hinekoia O'Leary	The Stroop Effect	HGHS
0807	Maryam Habib	Dishwash liquid vs. Bacteria	HGHS
0808	Madeline Cox	Barley Benefits: Fact or Fiction	HGHS
0809	Skyela Moore	Biodegradable Bags	RJHS
0810	Keira Kennedy	Can chewing gum help you focus?	RJHS
0811	James Milroy and Blake Freyberg	Concert Tration	SPC
0812	Matthew Chanwai	Blood O2 Saturation Drop	SPC
0813	Fred Phillips and Jack Thomas	Remedies for weeds	SPC
0814	Grace Wisnewski	Hot Cross Cows	SPS
0815	Raghu Nathan	LI _FI	
0816	Caleb Leslie	Let's Make the River Great Again	SJC
0817	Quinn Wilson & Sam McQuilkin	Long Term vs Short Term Goals by Age	SJC

0818	Thomas Calder	Fingerprints are they Genetic?	SJC
0819	Charlie Squire & Christian Sauni	Beats per Minute	SJC
0820	Taylor Lincoln	Through my dog's eyes	TAC
0821	Kate Shannon and Mia Ellis	Leavening Loaves	TAC
0822	Michelle Jeng	Mmmm it smells nice	WDSG
0823	Catherine Cross	Gluten free bread	WDSG
0824	Hayley Williams & Sophia Scaramuzza	Bacteria Beware	WDSG
0825	Ellena Wood & Sarah Crowther	Musical madness	WDSG
0826	Francesca Cullen	Do we really all this plastic	WDSG
0827	Julia Sharatt & Sarah Hilton	Accelerating Germination	WDSG



Our aim at Waikato Regional Council is to make the mighty Waikato the best it can be. A healthy and sustainable environment. An economy that punches above its weight. Communities that are as resilient as they are vibrant.

Our work is as diverse as our region. We have a mix of operational and strategic functions, which includes working with iwi, individuals and community groups to improve the region's water quality, as well as biodiversity. We do other things too, including public transport, navigation safety, environmental monitoring and enforcement, planning and funding.

We can't succeed on our own. Working with others is at the heart of how we do things, and it's these partnerships that are key to forging an exciting future for the Waikato.

The council is proud to support young scientists with a genuine interest in our environment, who are using out-of-the-box-thinking to develop solutions to real problems.

EXHIBIT CLASS: 9 – YEAR 9-10 MATERIAL WORLD

Sponsored by: SciPAD



	Name	Exhibit title	School
0901	Deveshh Bali	Microbial Fuel Cell	HBHS
0902	Thomas Ter Beek	Sailing in Troubled Water	HBHS
0903	Harrison Peaker and Hitchen Raaj	Acid vs Voltage	HBHS
0904	Thomas Harvey	Flour Power	HCS
0905	Kyla Pearson	Keep our H2O good to go	RJHS
0906	Ben Deason & Alex Keogh	Pepsi vs Coke	SJC
0907	Conall O'Toole	Food Waste don't Bin it!	SJC
0908	Jack Fraser-Jones & Matthew Jeremiah	Different Heating rates of Solutions?	SJC
0909	Josh Desingano & David Castillo	Rice Cooking	SJC
0910	Annabel Johnson	Save our sandwich	WDSG
0911	Niamh McCormack	Dri fact or fiction	WDSG
0912	Caitlin Lou & Kaitlin Thorrold	The Invisible Investigation	WDSG
0913	Brooke Manderson	Fizzy or Flat	WDSG
0914	Phoebe Barris & Isla McCabe	U make me melt	WDSG

EXHIBIT CLASS: 10 – YEAR 9-10 PHYSICAL WORLD

Sponsored by: KIWANIS CLUB OF WESTSIDE HAMILTON

Kiwanis

www.kiwanis.org

	Name	Exhibit title	School
1001	Sam Priest	Over-charged	HBHS
1002	Luca Sweetman	Running Flat	HBHS
1003	Kaya Lawrence and Raihan Aizam	Timber Wall Framing	HBHS
1004	Alex Liu	Missile Motion	HBHS
1005	Cole Brewerton and Jacob Kilgour	Lift Off	HBHS
1006	Alice Duncan	Blues Snooze?	SPS
1007	Reilly Benefield	Dispersion and Absorption of Laser light in Water	SJC
1008	Jack Edger & Sydney Sole	Rocket Science	SJC
1009	Harrison Holden	Efficient Fuels	SJC
1010	Stefan Lipinski & Hamish Wilke	Geometry of Goal Scoring in Soccer	SJC
1011	Christian Pearson	Water Composition and Sound	SJC
1012	Harry Ward-Crook & Nick De Vries	Wax on Wax off - Snowboards	SJC
1013	Molly Stokes and Bella O'Dea	Cool Waves	TAC
1014	Liv Davys	What conducts best-fruit or vege	WDSG

EXHIBIT CLASS: 11 – YEAR 9-10 PLANET EARTH AND BEYOND

Sponsored by: **KIWANIS CLUB OF WESTSIDE HAMILTON**

Kiwanis

www.kiwanis.org

	Name	Exhibit title	School
1101	Cayden Buitendach	H2grOw	HBHS
1102	Kaeden Cresswell	Will it rain?	TAC



Hill Laboratories **TRIED, TESTED AND TRUSTED**

Hill Laboratories is New Zealand's largest 100% privately owned and operated analytical testing laboratory with three major testing areas: agriculture, environmental and food & bio analytical. Tried, tested and trusted for over 30 years, our focus has remained unchanged: providing New Zealanders with the best analytical testing service on offer.

Founded in 1984 by Dr Roger and Anne Hill, the company remains family owned today. With over 400 staff working across its laboratories in Hamilton, Christchurch, Auckland, Blenheim and Wellington, it is a significant employer of science graduates from New Zealand tertiary institutions.

EXHIBIT CLASS: 12 – YEAR 11-13 SENIOR SCIENCES

Sponsored by: HILL LABORATORIES



Hill Laboratories
TRIED, TESTED AND TRUSTED

	Name	Exhibit title	School
1201	Holly McCullum	Impact of negative and positive words on growth of Mung seeds	HHS
1202	Samantha Brown	Binaural Beats	SHGC
1203	Isabella Ranum	Relatedness of Kiwi with other Aves	SPS
1204	Siobhan Dolan	Taonga on the Maunga	SPS
1205	Jack Foley	Investigating Ruminant Buffer Capacities for Dairy Cattle	SPS
1206	Jack Foley	Investigating Power & Temperature Gradients of a Thermoelectric Generator	SPS
1207	Marin Kittaka	Forest Insect Diversity	SPS
1208	Kate Nielsen	Effect of Water Quality on Macro-invertebrate Biodiversity	SPS
1209	Harrison Lynch	Effect of Urbanisation on Stream Water Quality	SPS
1210	Stephanie Giltrap	Mystery Chicken Disease	SPS
1211	Cassandra Farmilo	Using Newtons rings to find refractive index	SPS
1212	Julia Powierza	Effect of different wavelengths on photosynthesis in red vs green leafy veges	SPS
1213	Amelia le Comte	Nut-rition	WDSG

**EXHIBIT CLASS: 13 – YEAR 7 – 8 JUNIOR INVENTIONS AND
TECHNICAL INNOVATIONS**

Sponsored by: **ENGINEERING NZ**



	Name	Exhibit title	School
1301	Taleisha Lewis	Ear Goggles	FIS
1302	Ashton Vanin	The Backpack Tent	HS
1303	Lucy Lawrence	Snore-No-More	MIS
1304	Sapphire Ward-Leen and Xanthe Wooten	Tote-ally Floored!!	OS
1305	Alexandra Smith	Help For Kids From Kids	OS
1306	Brady Mitchell and Kouper King	Drastic Plastic	OS
1307	Allen Yuan	Once you forget there's no need for regret	PIS
1308	Elizabeth Chen	Bolt Of Lightning	PIS
1309	Lilyko Feehily	Reuse Ur Cartons	PIS
1310	Lauren Geer	Rubbish Taniwha- Unique Rubbish Collector	TPS
1311	Zac Littin and Indi Single	Bee-Utiful NZ	WS

**EXHIBIT CLASS: 14 – YEAR 9 – 13 SENIOR INVENTIONS AND TECHNICAL
INNOVATIONS**

Sponsored by: **ENGINEERING NZ**



	Name	Exhibit title	School
1401	Lachlan Braithwaite	Get A Grip	HHS
1402	Odin Roberts and Edgar Way-Keohane	Dog Waste Disposal Unit	RJHS
1403	Jana Stokes and Abby Bartels	Bobble Trough	SPC
1404	Kane Stirling	to be confirmed	SPC
1405	Olli Single	EVERY 1 COUNTS	WS

EXHIBIT CLASS: 15 – YEAR 7 & 8 SCIENTIFIC WALL CHART

Sponsored by: MORPHUM ENVIRONMENTAL LTD



	Name	Exhibit title	School
1501	Olivia Wang	Carbon is Everywhere	BMNS
1502	Annika Fang	Sulfur	BMNS
1503	Dylan Simpson	Sodium: The Radical Reactor	BMNS
1504	Kinnon Broekhuizen	Gallium	BMNS
1505	Sophia Aalders	Einsteinium	BMNS
1506	Rupert Leary	Caesium	FIS
1507	Lauren King	Bismuth	FIS
1508	Megan McInnes	Lithium	FIS
1509	Adithya Bandaru	Carbon	FIS
1510	Samuel Knaggs	Neon	FIS
1511	Matthew Tangney	Krypton	FIS
1512	Jarrin Xin	Radium	FIS
1513	Kendyl Barr	Sulphur	HS
1514	Lana Quickfall	Aluminium	HS
1515	Sharlyce Beaufoy	Neon	HS
1516	Ashley Bourke	Magnesium	HS
1517	Keana Woodfield	Chlorine	SPS
1518	Lulu Given	Neon	SPS
1519	Keira Hayidakis	Potassium	SPS
1520	Gus Challis	Sulphur	SPS
1521	Charlise Davison	Calcium	SPS
1522	Thomas Nogaj		SPS

1523	Tyla Purdie	Potassium	SPS
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The The Electrical Training Company, or Etco, is a wholly owned subsidiary of Master Electricians (previously ECANZ) established to provide employment and training for the electrical industry in New Zealand.

Our two main areas of activity are the employment and placement of electrical apprentices via our group apprenticeship scheme and the provision of training courses for apprentices and tradespeople.

Since our establishment in 1991, our commitment to producing the best has helped thousands of Etco apprentices and students achieve outstanding results and successes in industry competitions, national examinations and the industry itself.

Training of apprentices is a combination of on-the-job training through placements with electrical companies and contractors and off-the-job training. This involves study at home, attending our night classes and block courses at one of our Hamilton training centre.

Apprentices receive extensive instruction, supervision and support throughout all stages of their training which involves a series of assignments, assessments and examinations. For more information – www.etco.co.nz

EXHIBIT CLASS: 16 – YEAR 9-13 SENIOR SCIENTIFIC WALLCHART

Sponsored by: THE ELECTRICAL TRAINING COMPANY



	Name	Exhibit title	School
1601	Douglas Hamilton	Hydrogen	BMNS
1602	Thomas Ter Beek	Hydrogen	HBHS
1603	Marina Aleksic	Carbon	HGHS
1604	Kiera Sullivan	Titanium	HGHS
1605	Chloe Aish	Mercury	HGHS
1606	Grace Chapman	Krypton	HGHS
1607	Amity Watson	Krypton	HGHS
1608	Tegan Andrews	Helium	HGHS
1609	Olivia Gyde	Carbon	HGHS
1610	Thomas Shi	Electron Configuration	HHS
1611	Grace Richards	Sulphur	SHGC
1612	Amy Mohring	Gold	SHGC
1613	Sophie Young	Cobalt	SHGC
1614	Keelin Leong	Mercury	SHGC
1615	Holly Taylor	Phosphorus	SHGC
1616	Anne George	Helium	SHGC
1617	Myella Abulencia	Hydrogen	SHGC
1618	Kayla Reymer	Magnesium	SHGC
1619	Jessica Wara	Mercury	SHGC
1620	Kimaya Naidoo	Plutonium	SPS

1621	Savana Bourke	Beryllium	SPS
1622	Eva McGuire	Sodium	SPS
1623	Joanna Li	Tantalum	SPS
1624	Anna McLean	Mercury	SPS
1625	Hunter Robinson	Uranium	SPS
1626	Jessica Walton	Bismuth	SPS
1627	Amisha Sadani	Colbalt	SPS
1628	Masha Gavrilova	Fluorine	SPS
1629	Rheannah Rapley	Bismuth	SPS
1630	Sam Inglis	Neon	SPS
1631	Ally Rea	Plutonium	SPS
1632	Charlotte Pamment		SPS
1633	Alice Duncan	Aluminium	SPS
1634	Talia Gilbertson	Calcium	SPS
1635	Lachy Dawe	Lithium	SPS
1636	Caitlin Moriarty	Caesium	SPS
1637	Jonty Schick	Helium	SPS
1638	Briar Spittle	Potassium	SPS
1639	Connor Delaney	Oxygen	SPS
1640	Heidi Baldwin	Polonium	SPS
1641	Sebastian Mehrrens	Einstenium	SPS
1642	Sophia Payne	Carbon	SPS
1643	Martine Legros		SPS
1644	Georgia Cutler		SPS
1645	Toby Robinson		SPS
1646	Alice Ankersmit	Antimony	WDSG
1647	Michelle Jeng	Nitrogen	WDSG
1648	Kate Seager	Tin	WDSG

EXHIBIT CLASS: 17 –SCIENTIFIC VIDEO

Sponsored by: WSTA



	Name	Exhibit title	School
1701	Gabby Jackson	Microwaves Explained by Gabby Jackson	BMNS
1702	Sophie Orum	Thomas Young: Double Slit Experiment	BMNS
1703	Ryan Snowsill	Cat Jumping	BMNS
1704	Isla McNulty	Aotearoa Land of the Long White Cloud	BMNS
1705	Lucy Downing & Isabella Shanks	New Zealand Adaptations	HGHS
1706	Sree Akshaiyaa	Bradycardia	HHS
1707	Josh White and James Gow	Moon Landing Animation	TAC
1708	Emma Bartram	Physical and Chemical Change	WDSG

EXHIBIT CLASS: 18 – YEAR 7 – 8 OBSERVATIONAL DRAWINGS

Sponsored by: WSTA



	Name	Exhibit title	School
1801	Sarah Nakayama-Mattingly	Taraxacum officinale	BMNS
1802	Annie Yu	Gazania asteraceae	BMNS
1803	Brooke Taylor	Photinia fraseri	BMNS
1804	Sierra Pattemore	Sedum treleasei	BMNS
1805	Lara Dent	Rosa hybrida	BMNS
1806	Lilia Ikai	Aloe arborecens	BMNS
1807	Joy Liao	Acer pseudoplatanus	BMNS
1808	Reuben Green	Pittosporum tenuifolium	CMS
1809	Amber Mauch	Camellia japonica	CMS
1810	Aimee Hopkins	Digitalis purpurea	CMS
1811	Hannah Goodwin	Camellia sasanqua "Plantation Pink"	CMS
1812	Levi Brown	Dionaea muscipula	CMS
1813	Danielle D'Ath	Manuka leptospernum	CMS
1814	Sienna Hargreaves	Clanthus maximus kaka beak	CMS
1815	Jasmine Wilson	Pittosporum cornifolium Tawhirikaro	CMS
1816	Max Turley	Camellia sasanqua	CMS
1817	Emma Borman	Veronica Diosmifolia	CMS
1818	Sarah Collins	Sir Tristram	HGHS
1819	Sahara Stanton	Daffodil	HS

1820	Joie Lin	Cyclamen persicum	MCS
1821	Cici Guo	Orchidaceae cymbidium	SS
1822	Jerry Zou	Metsideros excelsa	SS
1823	Roy Zhu	Dianthus chinensis	SS
1824	Millie Wright	Kawa Kawa	SPS
1825	Nick Grenaney	Piper excelsum	SPS
1826	Emily Bennett	Piper excelsum	SPS
1827	Annabel Chapman	Kawa kawa	SPS
1828	Ruby Macklow	Sophora Microphylla	SPS
1829	Abby Wilson	Piper excelsum	SPS
1830	Summer Spittle	Kawa kawa	SPS
1831	Missy Roberts	Piper excelsum	SPS
1832	Boh Richie	Melicytus ramiflorus	SPS
1833	Luella Campbell	Thelymitra cynea	SPS
1834	Max Downey	Prumnopitys ferruginea	SPS
1835	Chahat Boparai	Piper excelsum	SPS
1836	Jessica Vanderpyl	Cyanthea dealbata	SPS

EXHIBIT CLASS: 19 – YEAR 9 – 13 OBSERVATIONAL DRAWINGS

Sponsored by: LIVESTOCK IMPROVEMENT CORPORATION (LIC)



	Name	Exhibit title	School
1901	Nikita Billington	Echeveria imbricata	HHS
1902	Russel Candy	Mountain Five Finger Pseudopanex	SPS
1903	Gemma Hewson	Alectryon excelsys	SPS
1904	Kate Galien	Pseudopanaz arboreus	SPS
1905	Chloe Driscoll	Pittosporum tenuifolium	SPS
1906	Sophie O'Connor	Anemone coronaria	SPS
1907	Anna Parsons	Phormium tenax	SPS
1908	Gemma Wills	Piper excelsum	SPS
1909	Sang Woo Lee	Piper excelsum	SPS
1910	Arabella Barrio	Piper excelsum	SPS
1911	Jessica Goldsmith	Kowhai Sophora sp.	SPS
1912	Amy Aranyos	Pseudopanax sp.	SPS
1913	Esme MacGillivray	Alectryon excelsus	SPS
1914	Asarina Johnson	Red Iceland Poppy	TAC
1915	Simon Carter	Rosa linneus	TAC
1916	Dillon Holmes	Tradescantia spathacea	TAC
1917	Jackson Waitai	Pachycereus pringlei	TAC
1918	Mio Morisaki	Helianthus annuus	WDSG
1919	Emily Gilchrist	Dodecatheon pulchellum	WDSG
1920	Alexis McKinnon	Althaea officinalis	WDSG
1921	Amelia le Comte	Passiflora edulis	WDSG

1922	Nuo Chen	Echeveria colorata	WDSG
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LIC (Livestock Improvement) is one of the largest integrated herd improvement organisations in the world. A dairy farmer owned co-operative, LIC has been providing services to farmers since 1909.

Its services range from herd testing and milk analysis, to artificial breeding, animal health, farm advisory, herd recording, DNA analysis, farm automation, improving herd reproduction and automated pasture measurement.

LIC's head office is located in Hamilton but it has offices and representatives across New Zealand and in the United Kingdom, Ireland, and Australia, with agents in South America, United States and South Africa.

EXHIBIT CLASS: 20 - SCIENTIFIC PHOTOGRAPHY

Sponsored by: WINTEC



	Name	Exhibit title	School
2001	Olly Hills	Fossilised Shells in Greywacke	BMNS
2002	Mikaela Davidson	Marokopa Coastline	BMNS
2003	Samantha Lane	Mammoth Hot Springs	BMNS
2004	Sam Atkins	Nature is Mighty	BMNS
2005	Sam Atkins	Purangi Estuary	BMNS
2006	Ben Wright	Diorite rock	BMNS
2007	Madeleine Jago	Punakaiki Pancake Rocks	CMS
2008	Eve Donoghue	Limestone	FIS
2009	Jorja Vette	Andesite Rock	FIS
2010	Kaitlyn Porter	Limestone Rock	FIS
2011	Aaminah Maqbool	Gneiss	FIS
2012	Hunter Moon	The Great Rift Valley	HBHS
2013	Hunter Moon	The Kopjes	HBHS
2014	Dylan Manders	Obsidian	HBHS
2015	Sarah Purcell	Rose Quartz	HGHS
2016	Katelyn Graham	Amethyst	HGHS
2017	Hilary Clarke	Quartz	HGHS
2018	Tiara Rini Kura Hansen	Greenstone	HGHS
2019	Kennedy Hosking	Scoria	HGHS
2020	Sam Jack	The Southern Alps	HHS
2021	Alexis Fink	Wetlands	SS
2022	Seumas Eade	Montserrat	SPC

2023	Gane Harbutt	Rock erosion	SPC
2024	Ryan Wisnewski	Flowing Water	SPS
2025	Grace Wisnewski	Metamorphic Rock	SPS
2026	Johannah Downs	Humphries Castle	TAC
2027	Nicki King	Rose quartz	TAC
2028	Lennox Grey	Limestone	TAC
2029	Abbie Moore	Raglan Boulder	WDSG
2030	Estella Wainui-Mackle	Earthquake Effect	WDSG
2031	Olivia McDonald	Bridging the Gap	WDSG
2032	Rosie Ryan	Champagne Pool	WDSG
2033	Jyotti Singh-Sekhon	Bricks	WDSG
2034	Charlotte Cowan	Rocks on a Hill	WDSG
2035	Jenna Brown	Gravity	WCS

PRIZE GIVING DETAILS

Prize winners will be notified by your school on Monday (19th August) and a list will also be available online at www.waikatosciencefair.org.nz. The **NIWA Waikato Science & Technology Fair** official prize giving ceremony will be held on

Tuesday 20th August 2019

at

**St. Paul's Collegiate School
77 Hukanui Road
Chartwell
Hamilton**

Start time: 7:00 p.m.

Please arrive by 6:50 p.m. to allow for a prompt start.

2019 RESULTS

Results for the 2019 fair will be available following the prize giving ceremony on the NIWA Waikato Science and Technology Fair website:

www.waikatosciencefair.org.nz



On behalf of the NIWA Waikato Science and Technology Fair organising committee we hope you have enjoyed your fair experience and look forward to seeing many of you again next year.