

House of Science Central Waikato Impact Report for T. R. Ellett Agricultural Research Trust 2022 Sponsorship





HOUSE OF SCIENCE.

RAISING SCIENTIFIC LITERACY

CENTRAL WAIKATO CHARITABLE TRUST

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Please find enclosed our impact report for the support we have received from T.R. Ellett Agricultural Research Trust 'Celestial Sponsorship' for the year 2022.

As a charitable trust, we are very reliant on sponsorships and continue to appreciate being a charity that T.R. Ellett Agricultural Research Trust wishes to be associated with. Below is an overview of the House of Science Central Waikato vision and purpose, and the difference your support has helped us make in our community.

The House of Science Central Waikato Charitable Trust is a not-for-profit organisation with a vision that *"every child in the region is scientifically literate"* <https://houseofscience.nz/hamilton>. We do this by empowering teachers to raise scientific literacy by providing comprehensive science resources for use in all NZ year 0-8 teaching environments.

Our progress in 2022

By the end of 2022, we obtained our goal of reaching 50 member schools across Hamilton and Central Waikato. Our previous record in 2021, of 602 resource science kit bookings was nearly doubled in 2022 with a total of 1,138 bookings made. On average, approximately 1,234 students per week were able to increase their science literacy by having access to our high-quality science resources. During our busiest weeks we regularly had between 36-39 resource kits in schools.

We significantly grew our operations and made two very big decisions. In July, we added to our fleet and purchased a second vehicle (figure 1a). Our delivery routes were growing too big to continue relying on the sponsorship of the LIC Ute, our own vehicle and our volunteers' cars. Throughout the year we drove 11,245 kilometres around Hamilton and Central Waikato and 57 volunteers donated 2,184 hours of their time helping us clean organise and sort the science resource kits and deliver them to schools.

In November, we made the biggest change to our physical operations yet and moved to new premises. For four years, the Trust was kindly supported by the University of Waikato to operate from the Ruakura campus. Unfortunately, due to changes in their business, the university could no longer continue sponsoring us, and we had to vacate the building. We had to explore the rental market to find premises that catered to our budget and was suitable for our growing operation. We are excited about our new space and look forward to ensuring we use it to the best of our abilities (figures 1b & 1c). We aim to continue increasing the number of students that have access to the House of Science resource kits.

We continued to work with companies like Gallagher, Hill Laboratories and Livestock Improvement Corporation (LIC) to ensure more rural schools can access our resources.



1a



1b



1c

Figure 1a: Our newest vehicle helping us reach more student around rural Central Waikato. Figure 1b & 1c: Our new premises.

Shifts in approaches to science made by the member schools of House of Science Central Waikato

To assess if we are meeting our goals and expectations and ensure that we continue to provide a quality service which meets the needs of our member schools, feedback and data are collected. An evaluation form is emailed to schools seeking stories from students and teachers on the impact of our service. Our survey results have demonstrated a positive shift in our members schools' ability and confidence to teach science. Once a term, a more in-depth survey is sent to schools which aims to identify a shift in both students and educators' attitudes towards, and impact on, science learning through the use of these kits. Our survey results have demonstrated a positive shift in our members schools' ability and confidence to teach science. It also shows a positive shift in students' attitudes towards science. Below are some of the statistics gained from those who have responded to the more in-depth questionnaire.

- 43% of teachers and their students used the resources in te reo Māori.
- 57% of the time, the kit is being used in year levels 3-6.
- 66% reported that 'all of their students' are engaged with the activities in the science kit.
- The remaining 34% reported that 'most of their students' are engaged with the activities in the science kit.
- 67% reported that 'most to all students' linked science to everyday life as a result of using the kit.
- 50% of teachers reported that 'some to half' of their students are beginning to think critically – critiquing their own and others' data as a result of using the kit. While 38% reported 'most to all'.

When questioned about how having access to the resource kit has helped them:

- 80% 'agreed or strongly agreed' that through using the kit, they understand more about what science learning they need to focus on with their students.

- 100% 'agreed or strongly agreed' they found the teacher notes useful in helping increase their science understanding.
- 90% 'agreed or strongly agreed' they found the teacher notes useful to help them with student questioning.
- 80% 'agreed or strongly agreed' that as a result of using these resources, they feel confident about designing their own science activities for their class.
- 81% reported that they used the activities in the kit to teach curriculum areas other than science.
- 85% 'strongly agreed' and 15% 'agreed' that they enjoyed using the science kit with their students.

Teacher Professional Development Workshops

Once a term, we host a teacher professional development (TPD) session, to which member schools can send their teachers to attend. The sessions are designed to inform teachers of new resource kits and developments and connect them with relevant members of the community who have a specific knowledge or viewpoint to assist in teaching. These sessions usually start at 3:30pm, requiring teachers to attend workshops straight after school, so we provide a large afternoon tea of refreshments and finger food.

Term 1 was held online via Zoom and was hosted by The Science Learning Hub, an on-line digital collection that is a fantastic science educational resource for teachers. Representatives talked to the teachers about how to navigate the website and use the collections they have created that directly support the learning of specific HoS resource kit.

Term 2 had Hamilton City Council demonstrate their brand-new, purpose-built water education model which demonstrated the water infrastructure operated by the city. The Waikato River flows through the heart of the model and allows students to engage with the awa, as our precious water source, and a hugely significant part of our region for Waikato-Tainui.

Term 3 had a Year 5/6 teacher from Silverdale Normal School talking about how plants engage learners. As well as this, regions Professional Learning and Development teacher for House of Science NZ, talk about how HoS are now an MOE accredited Professional Learning Development (PLD) Provider and how their school can benefit from this.

Faculty of Education Teacher Training Course

To empower future New Zealand primary teachers, we provided five free training sessions in March 2022, for second year and graduate diploma teacher training students enrolled at the University of Waikato. These sessions enabled trainee student teachers to have hands-on experience with the science resource kits; undertake the

activities and discuss amongst themselves how they relate to the science curriculum; and how these could be used to help teach other areas of the curriculum. By the end of the session all student teachers agreed that the kits would make teaching science to the curriculum much easier. By providing this opportunity to train student teachers, a large section of future New Zealand teachers, who will eventually be teaching young New Zealanders, will be better prepared and have more confidence to teach high quality science.

These training opportunities and feedback from student teachers allow us to establish beneficial relationships between the University and HoS CW. We were so busy with the lessons that no photos were taken.

Support Acknowledgment

We are proud of our sponsors and supporters and acknowledge them whenever we can. We prioritise promoting those businesses who support us to help raise science literacy in our community. As an important sponsor, we acknowledge the T.R. Ellett Agricultural Research Trust sponsorship in several ways.

Visual Acknowledgment of support

The T.R. Ellett Agricultural Research Trust logo is displayed in a variety of ways: advertised on the official HoS CW website (Figure 2a); as well as the sponsored Science resource kits (Figure 2b) and the HoS CW banner displayed at events (figure 2c). We also talked about the sponsorship in our 2022 Term 1 newsletter (figure 3).



2a





Figure 2a. The T.R. Ellett Agricultural Research Trust logo advertised on the Central Waikato webpage of the House of Science website. Figure 2b: The logo of the What's the Buzz science resource kit. Figure 2c: The logo as seen on our banner.

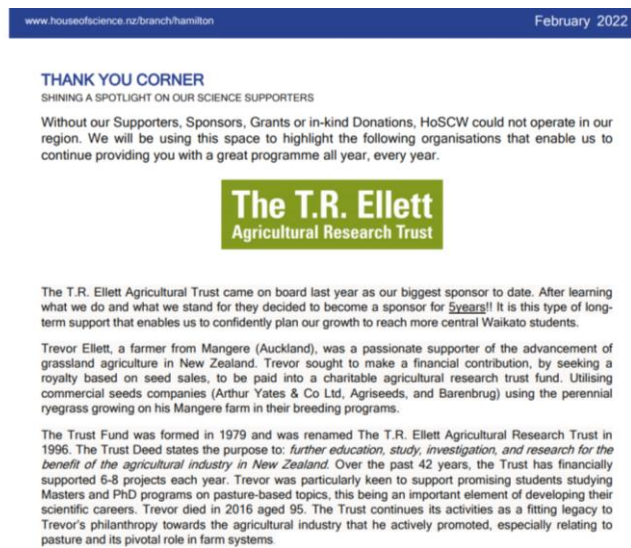


Figure 3. Our acknowledgment of the T.R. Ellett Agricultural Research Trust support in our Term 1 2022 newsletter.

Presentation of Certificate of Support

At last year's Annual General Meeting, we held a special event where we presented 'Certificates of Appreciation' to our supporters and sponsors. We presented T.R Ellett Agricultural Trust with our 'Celestial Sponsor' certificate and then posted our appreciation post on our Facebook page (figure 4).



Figure 4. Errol Thom accepting our "Celestial Sponsor" certificate of Appreciation at the 2022 HoS CW AGM

Moving Forward into 2023

Due to the number of schools and bookings continuously increasing and to ensure our quality of service remained high, we decided that from the start of 2023 all schools would be placed on a fortnightly booking system. This means that schools have a resource kit for nearly two weeks. Kits are dropped off on a Monday morning as usual, however instead of being picked up that Friday they are now picked up the following Thursday morning. This change has a flow on effect on other areas of our operations. It means that the vehicles are only used once a week, however, remain vital to our operations as they are used to service schools as far west as Raglan (figure 5).

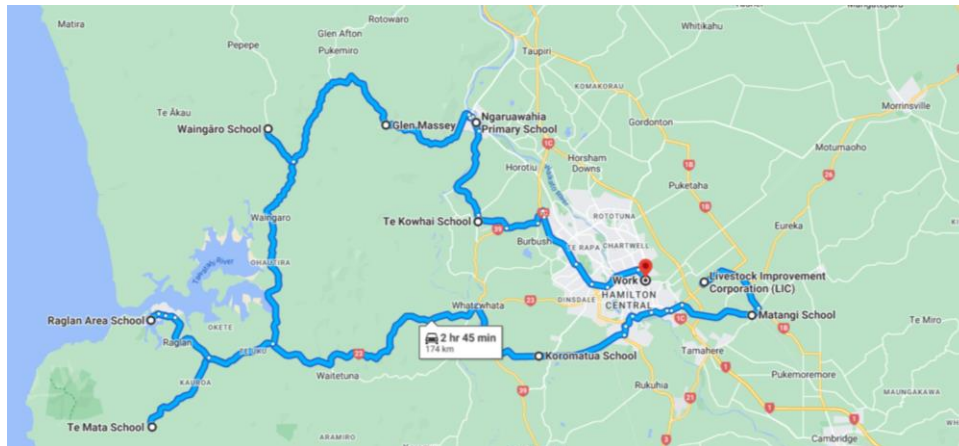


Figure 5. A typical weekly route for one of our paid drivers.

Ensuring our resources are kept in the best possible condition and that our operations can run smoothly enables teachers to have confidence in our service. Teachers rely on our resource kits to help their students understand the world around them. Participating in science is not just important for a child's education and future job prospects. It is important in giving them the means to make informed decisions for themselves and their future. When they are older, they will be equipped to make well informed choices for themselves, their family, and community.

We thank you once again for choosing House of Science Central Waikato as a charity that you supported in 2022. We welcome the opportunity to demonstrate these kits to you and discuss further regarding the long-term vision of our charity. Be assured that your continued support is make a significant difference in the lives of thousands of young people with regards to their scientific literacy which will have a long-term flow on effects throughout their lives.

Regards,

Catherine Frericks

General Manager, Hamilton / Central Waikato

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Welcome to the House of Science

By Anne Boswell

Schoolchildren across New Zealand are learning about agriculture and food production through the fun of science.

Forget hokey pokey and baking soda volcanoes – New Zealand's rural kids are becoming immersed in science that has real-life applications for them and their families.

House of Science, a charitable trust founded by biochemist and science teacher Chris Duggan 10 years ago, provides schools with high-quality, bilingual science resources that empower primary and intermediate teachers to deliver engaging, hands-on science lessons in the classroom, with over 600 schools taking part in the initiative nationwide.

During her teaching career Duggan became concerned at the lack of science knowledge students had when arriving at high school. Following a 2013 ERO report that stated over 70% of New Zealand's primary and intermediate schools lacked an effective science programme, she founded House of Science with the aim to increase science literacy for all primary and intermediate age children.

House of Science Central Waikato general manager Catherine Frericks says the resources are being used in rural schools in the region with a big impact.

"The science resource kits cover topics such as weather patterns, soil science, water health, pests, plant growth, milk production and other subjects that are relevant to rural life," Frericks says.

"By giving students access to this sort of scientific information they are able to better understand the decisions their families and local community have to make to ensure future prosperity and environmental protection."

House of Science Central Waikato, which is associated with the national office but run as an independent charitable trust, is based in Hamilton. The programme has seen exponential growth from its beginnings five years ago, with



Te Ariki and Abigail looking at the Bees from the 'What's the Buzz' resource kit.

kits first going into schools in Term 3, 2018.

"We had four Waikato schools on board at the start, and by the end of 2022 we had 50," Frericks says.

"Because most teachers don't have a science background, they may not feel confident incorporating science into the classroom beyond a basic foundation. What House of Science aims to do is create a system where schools can borrow a science kit and empower teachers to do science in the classroom."

Each House of Science branch services approximately 100 schools, with schools joining through an annual membership subscription. There are four membership tiers, with schools choosing access to one, two, three or four resource kits per fortnight.

Kits are booked online, delivered to the school and picked up after use, to be cleaned and replenished for the next user.

"The very popular Moo to You kit gives an overview of how the dairy industry uses science. Activities in the kit include a grass-growing experiment that explains the importance of a varied diet for cows."

Each kit contains a minimum of five hands-on experiments, including equipment and consumables, bilingual student instructions and a teacher's manual.

The kits can be used in standalone science lessons, or as a foundation for other subjects such as mathematics or literacy. Schools can choose from around

38 kits, from traditional science topics such as Magnetic Madness and Mighty Microbes through to Soil Secrets, Water Analysis, Weather Ready and the very popular Moo to You, a kit that gives an overview of how the dairy industry uses science; activities in the kit include a classification activity, the chemistry of milk, dairying's environmental impact and a grass-growing experiment that explains the importance of a varied diet for cows to ensure a healthy calf and milk.

"These topics are pertinent to helping rural students make decisions – even helping their parents make decisions – and understand the importance of a healthy ecosystem," Frerick says.

"For rural people, these things are likely more than just a potential career – they are a way of life."

Schools pay a small membership fee, but over 90% of the actual cost of the service is subsidised by grants and sponsorship by local communities and businesses. It is also heavily reliant on volunteers to help deliver the service in the regions.

For Central Waikato, support from the local community and local businesses is



School kids across the country are benefiting from a science resource from the House of Science designed to increase science literacy for all primary and intermediate school children. The contents of the Nano-Chem science resource kit.

critical to the success of the programme. Grants from local businesses such as Gallaghers, the TR Ellett Agricultural Research Trust and the Livestock Improvement Corporation mean the service can expand into more rural places such as Raglan and Te Kauwhata,

reaching even more rural schools.

Until November 2022, the University of Waikato sponsored premises for Central Waikato House of Science where three staff and 50 volunteers worked to get the kits out to schools.

"We want to make sure rural schools are not missing out, as small schools have small student numbers and limited funding," Frericks says.

"Our rural schools love having access to these kits and we are wanting to reach still more rural students. However, we are unable to do so without funding."

She says children are naturally curious, and House of Science is about providing them with lessons where they are encouraged to learn by asking questions.

"We aren't aiming to make everyone scientists, rather to help children understand science, how the world works and to ask questions and really retain that natural curiosity.

"We want to make sure that children have had adequate exposure to science before they enter high school." ■



Kits loaded into the LIC Ute ready to be delivered to the rural schools.



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