

**CURIOUS
MINDS**

HE HIHIRI I TE MAHARA



CURIOUS MINDS

SOUTH AUCKLAND SHOWCASE

2020-2022



TE HONONGA AKORANGA
COMET



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HĪKINA WHAKATUTUKI



CURIOUS MINDS

SOUTH AUCKLAND SHOWCASE

2020-2022

Everyone has a question: what's yours?

**If you had MONEY and EXPERTS to help,
could you answer it?**



TE HONONGA AKORANGA
COMET



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HĪKINA WHAKATUTUKI

INTRODUCTION

Kia ora and welcome to the Curious Minds South Auckland Showcase for 2020–2022!

The last few years have brought unprecedented disruptions to our lives and to our students' education. Living through a pandemic has given many of us a renewed appreciation of the value of science and technology for supporting modern life — everything from medical treatments to online learning.

It has also reinforced to us the great importance of supporting STEAM education both in and out of the classroom — and of empowering our young people to be the scientists, engineers, innovators and problem-solvers of tomorrow.

We are so proud to present this showcase packed full of inspiring stories and impactful STEAM learning. Our project teams have done incredibly well to complete their research amid challenging circumstances — not only did they pivot and adapt; in some ways, they even thrived.

These projects gave students opportunities to explore new ways of learning and working together, as well as a purpose to work towards in solving problems in their community with real tangible outcomes.

It is always a joy for me to see the partnerships and collaborations that arise with the support of whānau, STEAM professionals and educators in our communities. Together, there is so much we can do to continue to support our young people's learning.

However, the most credit must go to the students themselves — for their curiosity, their perseverance and their resilience.

With so much potential and enthusiasm, I'm excited to see what these students will do in the future!

**Ying Yang, Project Manager
Curious Minds South Auckland**



CONTENTS

Project Criteria	3
Project Data (2020–2022)	4
2020 Project Case Studies	
<i>Let it Rain!</i>	6
<i>War of the Mites!</i>	8
<i>Modelling Future Affordable Housing</i>	9
<i>Wai We o Tara Care</i>	9
<i>Planet Friendly Watering</i>	10
<i>Healthy & Sustainable Lunchbox Snacks</i>	11
<i>My Power ... My School</i>	12
<i>Use Less Today, Useful Tomorrow</i>	12

2021 Project Case Studies	
<i>Tipu Whare Water Testing</i>	14
<i>A Samoan Umu</i>	15
<i>Aratakina a Moemoea (Field of Dreams)</i>	16
<i>Exploring Astronomy</i>	18
2021 Ongoing Projects	19
2022 New Projects	20
Outcomes Snapshot	21

PROJECT CRITERIA

PARTICIPATORY SCIENCE PROJECTS MUST BE:

EDUCATIONALLY VALUABLE

Offer enduring educational value and two-way learning opportunities for those involved



SCIENTIFICALLY ROBUST

Tackle a research problem in partnership with STEAM experts, to generate new scientific and/or technological outputs

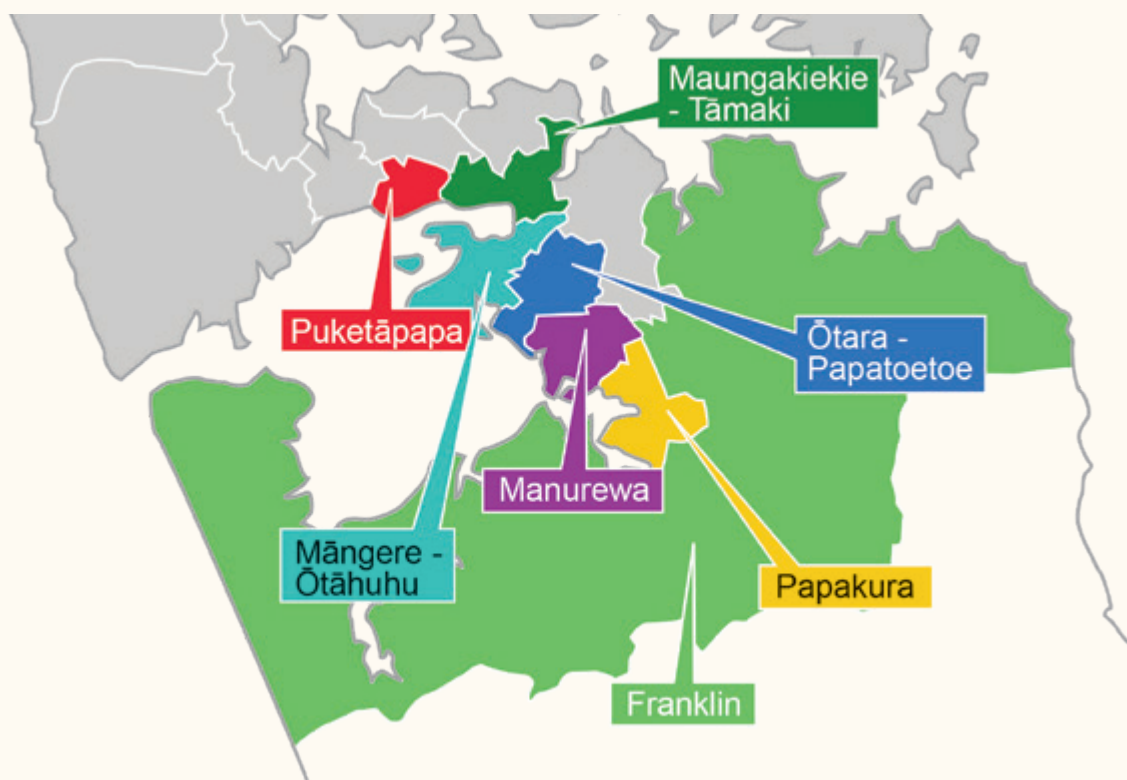


LOCALLY RELEVANT

Involve community members in research that is engaging, locally relevant and community driven



ELIGIBLE FUNDING AREAS IN AUCKLAND:



PROJECT DATA (2020–2022)



PROJECTS
FUNDED



YOUNG PEOPLE
ENGAGED



SCHOOLS
INVOLVED



ORGANISATIONS
INVOLVED



\$451,325

IN FUNDING DISTRIBUTED

25+



STEAM DISCIPLINES UNDER INVESTIGATION



2020 PROJECT CASE STUDIES



LET IT RAIN!

More than 100 Year 5 and 6 students from Reremoana School responded to the Auckland water crisis by designing a sustainable irrigation system that uses rainwater to water their new sensory garden.

Students set out to create a sensory garden to cater to the needs of neurodiverse peers, while also being a peaceful and restorative space for all to enjoy.

The students made their garden design choices in consultation with Autism NZ and their neurodiverse peers at Reremoana School. They also visited Auckland Botanic Gardens for inspiration during the design phase.

"Students were able to have a good understanding ... of how science and technology is used in everyday life. They were able to see that science does not just happen in a lab."

Chynna Swan, project lead
Reremoana School

Through their partnership with Watercare, students learnt to collect, monitor and treat rainwater to ensure that it was safe to use to water their garden.

During a trip to Hunua Dam, the students were shocked to see just how low Auckland's water reserves had fallen, inspiring them to find innovative ways to save water in their community.

Students created their own mini filtration systems to collect and treat rainwater, then met with Watercare engineers to discuss the requirements of the larger system needed for their sensory garden.

Students were able to further conserve water by including sensors in their design that determined when it had rained and watering wasn't needed.

A community build day was organised to plant the sensory garden and install the irrigation system. Visitors from the community were inspired to consider how they could collect rainwater for their own gardens.

Next steps include considering how best to share the herbs and vegetables grown in the garden with the community and studying garden usage to ensure it's being utilised to its fullest potential.





WAR OF THE MITES!

Guava moths were first identified in Northland 25 years ago and have made their way to Auckland over the last few years, decimating local fruit crops. Primary students from East Tamaki School in Ōtara partnered with Fisher & Paykel Healthcare and the Auckland Regional Council to combat the deluge of guava moths infesting their school gardens.

Students assessed a variety of insect traps and baits for their effectiveness against guava moths with guidance from Asha Chhagan, entomologist at the New Zealand Institute for Plant and Food Research.

Students designed traps that would attract guava moths while allowing other beneficial insects to thrive in their gardens. They used 3D printers to create prototypes of their designs and then tested them in the school gardens, using specially formulated solutions to bait the traps.

Data was collected from these prototypes to determine which trap designs were the most effective at trapping guava moths. This data will be used in the ongoing development of a pest management solution at East Tamaki School.

This project was presented at the 2020 Mayoral Conservation Awards ceremony, where it was a finalist for the Schools and Youth award category.



The level of engagement from the [STEAM] sector was awesome. As a result of being part of this project, our school has been invited to be part of future scientific investigations.

Helen Armstrong, project lead
East Tamaki School





MODELLING FUTURE AFFORDABLE HOUSING

Two dozen students from Manurewa High School partnered with the Auckland University of Technology to tackle the challenge of affordable housing availability in their local area.

Using mathematical modelling techniques, students collected and analysed data, comparing population projections in Auckland with the current supply of affordable housing in Manurewa.

Next, they identified the shortfalls that impacted local families, highlighting three primary areas of concern: limited space for larger families in affordable housing, lack of privacy in poorly soundproofed units and inaccessibility of public transport for low income families.

The students conducted mathematical modelling on each of these areas of concern to assess the economic factors that contribute to housing affordability.

“Getting the students to see the world through the eyes of mathematical modelling means we can break down the barriers and make it accessible.

Kerri Spooner, project lead
Auckland University of Technology

The project culminated in the students presenting their findings to Auckland Council's Planning Committee. Their submission was referred to the Affordable Housing Political Working Group for further consideration.

Seeing their research contribute to such an important community issue was a hugely rewarding experience for everyone involved, and it showed the students a valuable real-world application of mathematics.



WAI WE O TARA CARE

Nearly 50 young people from Ōtara participated in weekly activities to assess the impact of wastewater contamination in the local awa. Hosted by Accelerating Aotearoa, these investigations took place during after-school programmes and at school holiday “Geek Camps”.

The week-long camps allowed for deeper exploration of key topics, including observation techniques used by scientists, investigation of local wastewater overflow sites and an introduction to water quality testing equipment.

Participants studied seasonal and annual rainfall patterns to predict when wastewater overflow events were most likely to occur. They verified their predictions using weekly water quality testing for acidity, turbidity, phosphates, nitrates and *E. coli*. They found that wastewater overflows occurred every time more than 2mm of rain fell and that significant rain events contributed to *E. coli* levels up to 600 times greater than the Safe Swim threshold set by Auckland Council!

Students shared their findings on posters displayed at local libraries and signs posted near waterways, as well as in correspondence with their local MP's office. Future plans include meeting with other government agencies to gain commitments on regulatory and infrastructure interventions to protect the waterways.

“Our tamariki and rangatahi delighted in telling the story of their investigation [and] ownership of their space as scientists. To our tauira, this is now a new baseline for their self-expectations.

Judy Speight, project lead
Accelerating Aotearoa



PLANET FRIENDLY WATERING

A group of 17 intermediate students from the Gardens School — the self-styled Enviro Avengers — sought an environmentally sustainable and cost effective way to water their school's community garden. They partnered with Fisher & Paykel Healthcare mentors and an environmental scientist from Auckland Transport to turn their designs into reality.

To assess their irrigation needs, students first installed soil moisture probes and a weather monitoring station. They researched a variety of watering solutions in an effort to meet the challenges that arose from analysing the data they collected.



One such challenge was the likelihood of the garden drying out over school holidays, which would limit the productive window for supplying the community with fresh herbs and vegetables.

To address this issue, the Enviro Avengers designed an automated solar powered irrigation system to replace their expensive, wasteful and labour intensive hand-watering regimen.

While developing a prototype of their irrigation system, the Enviro Avengers were empowered by their science mentors to overcome challenges such as how to transport water uphill and how to secure a building platform for the rainwater collection tank.

"The visits from the mentors were very engaging for the students and gave them an opportunity to collaborate with real engineers and scientists."

Christine Hansen, project lead
The Gardens School



HEALTHY & SUSTAINABLE LUNCHBOX SNACKS

Nearly 300 students at Manurewa Central School participated in an inquiry to assess the nutritional content and sustainability of their packed school lunches. Their inquiry stemmed from concerns about the highly processed and excessively packaged snacks that teachers observed to be dominating lunchboxes.

Students engaged in healthy eating workshops under the guidance of Fern Pereira, co-founder of Clean Plate. They learnt how to interpret nutrition information on food packages and about some of the processes that highly processed packaged foods undergo.

The students conducted audits to determine how much waste from food packaging was being generated by their

peers. They also sorted and analysed the collected waste based on its sustainability and whether or not it could be recycled, discovering in the process that the majority of food packaging choices were not sustainable.

"The [project] gave the students something important, engaging and enjoyable to focus on ... and exposed them to role models from different professional backgrounds."

Callum Baird, project lead
Manurewa Central School

"When Fern [the food scientist] came and told us about how unhealthy we were eating, it motivated us to start making healthy food [choices]."

Year 6 student
Manurewa Central School

Using what they had learnt about healthy eating and sustainability, the students developed their own healthy recipes and compostable packaging.

The participants shared their findings and innovations with their community at a school open evening. They also revealed data analysis of changes to their eating habits over the course of the project.



MY POWER ... MY SCHOOL

Being curious and observing what happens around us from a young age is an important stepping stone in science learning. Students and teachers at Puna o le Atamai Aoga Amata, a Pasifika early learning centre in Māngere, based their project on the question: "What happens when you turn the lights on? Where does that light come from?"

Through classroom resources and visits from science partners, the children learnt about different energy sources, such as the sun and water. They explored water as a power source by playing with miniature water wheels in their outdoor playpit.

They also learnt how energy sources are converted into electrical energy to power the lights and other machines around their homes and in the classroom.

During a visit from a Fisher & Paykel Healthcare engineer, the children had the opportunity to pedal a stationary bike that transformed their kinetic energy into electrical energy to power a light on the handlebars.

The children also learnt about power as a limited resource and discussed ways to conserve power in their centre and at home.

" This learning will ultimately impact the thinking and decision making of our future citizens in the conservation and sustainability of energy.

Liz Sio, lead teacher
Puna o le Atamai Aoga Amata



USE LESS TODAY, USEFUL TOMORROW

Environmental concerns were also top of mind at Le Malelega a le To'elau, a Pasifika early childhood centre in Māngere, where children learnt how to sort, reuse and recycle the rubbish produced at their centre. Their goal was to learn about different waste streams and embed processes into their daily routines to minimise their impact on the environment.

A visit to the Waitākere Refuse and Recycling Centre was a big project highlight. Children explored a variety of uses for repurposed rubbish items and learnt practical tips for maintaining a worm farm.

Back at their centre, the children had the opportunity to use recycled materials for arts and crafts, including making gifts for family, papier-mâché planets and recycled plastic planter pots for their garden.

" The [rocket ship] designs made it more fun for the children to commit to being recycling champions.

Jacqui Itamua, project lead
Le Malelega a le To'elau



Armed with the knowledge of how to sort rubbish properly, the children needed a system in place to facilitate their rubbish collection. Working with engineers from Fisher & Paykel Healthcare, the children designed and created rubbish bins shaped like rocket ships.

The children helped to assemble the rocket ship prototypes and gave feedback after every iteration before perfecting their design and implementing it as a waste sorting system at their centre.



2021 PROJECT CASE STUDIES



TIPU WHARE WATER TESTING

After observing rubbish lining their local awa, a group of students from Panama Road School in Ōtāhuhu endeavoured to answer the question: "Is there evidence of water pollution and unsustainable disposal of community rubbish in the Tamaki River?"

After learning about the impact of potential pollutants on their local waterways, the students participated in a briefing with experts from the Manukau Institute of Technology (MIT) to determine which collection techniques to use in their research.

Using the chosen techniques, the students collected data from four locations, three times per week, over a period of several months. Their data was compared to data from

similar sites around Auckland using the Litter Intelligence Education Programme.

While findings indicated normal levels of phosphorus, nitrate, dissolved oxygen, biochemical oxygen demand, pH and temperature, all four sites displayed a 100% presence of coliform bacteria from sewage contamination, making the water unsafe for consumption.

Illegal dumping of rubbish was also a problem at all four sites. Using the Sea Cleaners Kit provided by School Squad, students determined that the most common types of litter were glass bottles, bottle caps and plastics.

The students shared their findings at a local board meeting with Auckland Council and Kāinga Ora, as well as at the University of Auckland. Live tests were conducted on water samples and findings were showcased in infographics.

During a site visit by MIT experts, students participated in a hackathon to develop a mobile app. The resulting app will be used to collect and analyse more data in the future, in order to create science-based solutions for improving water quality.

The students have planned to use this data to support an Education for Sustainability project that will expand into a school-wide initiative to minimise waste.





A SAMOAN UMU

Children and families from Seugagogo Aoga Amata Preschool in Ōtāhuhu explored the chemistry of cooking by constructing and using a traditional Samoan umu (oven). This exciting project combined Samoan language, history and culture with a wide range of STEAM learnings including maths, chemistry, physics and food technology.

An initial workshop led by Pauai Afele, head chemistry teacher at Manurewa High School, enabled the teachers to plan lessons and create learning resources to help them compare modern cooking methods with traditional Samoan methods.

The workshop covered different fuels (e.g. firewood and kerosene) for heating the rocks, as well as non-conducting materials that could be used to make tongs with which to hold the hot rocks safely.

Community elders then taught the children about the need for natural resources to survive, as well as the importance of looking after the environment.

Parents and community members also shared their knowledge of traditional Samoan food preparation methods, including how to use an asi (peeler/scrapper) to prepare taro and how to wrap fish in coconut leaves to protect it while cooking.

On umu making day, the community gathered to assist with preparing the umu and the food, as well as teach the children about all the tasks involved in the traditional meal preparation process.

Since then, the preschool's teachers have noticed increased parental engagement with their children's learning as a direct result of the project.

The sharing of cultural knowledge and experience of our parents ... has not only increased the engagement and participation of our children, but was also a paradigm shift in our parents' thinking of their role as teachers within that learning space.

Pereise Penn, lead teacher
Seugagogo Aoga Amata Preschool



ARATAKINA A MOEMOEĀ (FIELD OF DREAMS)

Winding through the suburban streets of Māngere, Te Ararata Stream presents a unique learning opportunity to study ecology in an urban environment. Supported by Māngere East Family Service Centre and scientists from the University of Auckland, the Te Ararata Stream Team sought to measure and assess the effect of stream restoration efforts on water quality and biodiversity.

More than 90 students participated in the project, collecting data from three different stretches of the stream with riparian margins ranging from established native trees (planted in restoration projects in 2017 and 2018, respectively) to a stretch that had no stream restoration works at all (bare lawn).

Monitoring protocols included tree audits, soil sampling, terrestrial invertebrate counts, aquatic macroinvertebrate counts and freshwater quality testing with Wai Care kits.

By the end of the project, students could see that there was a correlation between the age and diversity of replanting efforts to the rise of biodiversity gains and ecosystem processes. This showed the community that there were clear benefits to restoring and maintaining healthy stream environments.

An unexpected outcome of this project was the strong leadership that came from the students themselves, many of whom gave up their own free time to take part in the project outside of school hours.

"We are very proud of our cohort of students. They gave up their own time to offer nature a chance to grow and thrive."

Pragna Patel, freshwater educator
Te Ararata Stream Team

As the project's popularity spread, more students joined and a tuakana-teina approach developed, with older students training the younger ones. In this way, the participants learnt not only about ecology but also about the value of having good communication, teamwork and leadership skills.





EXPLORING ASTRONOMY

Children from three early childhood centres in Māngere and Papakura partnered with Stardome Observatory and the Auckland Astronomical Society to learn about astronomy from a Samoan perspective. Their inquiry was inspired when children wondered how Samoans traditionally interpreted astronomical phenomena to influence their daily activities.

Educators partnered with the wider community to share Samoan stories, myths and songs using observations of the sky to tell the time, predict weather events and identify the optimal time to harvest crops.

An unexpected outcome was the joy parents felt about sharing their cultural knowledge and seeing how much their children were learning all the time.

The children also learnt the Samoan names for types of clouds, planets, stars and seasons. During self-directed play, the children discussed their observations of the sky in both English and Samoan. They used these observations to make predictions about the weather.

The Stardome Observatory hosted a session for the children so they could learn about planets, stars and the phases of the moon. They were particularly fascinated by the moon's journey around the Earth. This science learning was extended when an astronomer visited

the early childhood centres, bringing a large reflecting telescope that children used to observe the sun and the moon. They were also able to make their own observations using telescopes and binoculars purchased with Curious Minds funding.

“It was wonderful to see the children’s enthusiasm and to hear the stories of how introducing this new area of interest has sparked the idea of becoming a scientist or an astronaut ... If getting exposed to science generates an interest in science, and education in general, that can only be a good thing for their futures.

Dr Niven Brown, scientist
Auckland Astronomical Society

2021 ONGOING PROJECTS

STORMWATER SLEUTHS

Researchers from Tread Lightly Charitable Trust are working with students from four schools in the Curious Minds region to monitor and analyse data on the pollutants caught in LittaTraps. The students are also developing appropriate intervention methods to help reduce the pollutants entering major Auckland waterways through the local stormwater system.

FOLLOW THE SUN

Students at Homai School are teaming up with scientists at Kia Kotahi Ako to explore solar energy in an effort to answer the question *"What is solar energy and how can we use it to improve our local community?"* As part of this project, the students are building their own 'solar suitcases' and investigating uses for solar power in their school and at home.

PUHINUI STREAM

Scientists at Whitebait Connection are working with students from six south Auckland schools to discover the biodiversity in their local waterways. Using water quality testing and sampling techniques, students will study the health of the Puhinui Stream at the Auckland Botanic Gardens (a good condition stream) and compare it with the health of their local streams.

BEE BENEVOLENT

Horticulture students from James Cook High School in Manurewa are setting up beehives in three different locations so they can compare the quality of honey produced at each site. They want to discover the impact different bee foraging sites have on honey as well as find out what people can do to protect and enrich bees.

KITCHEN TOOLS REIMAGINED

"How can we adapt kitchen tools to make them accessible for physically disabled users?" That is the design problem that students at Mt Richmond School have been seeking to solve. With the help of disability advocates, product designers and 3D printing technologists, the project team have been learning about the design thinking process as they develop and create their own prototypes.

HE WAKA EKE NOA

Students from Glenbrae School in Glen Innes are designing their own hauora (tranquility) and Pasifika gardens to create new spaces in their school for recreation, food growing and cultural appreciation. Through partnerships with Watercare and Auckland Botanic Gardens, the students are not only learning how to plant their garden but also how to make it thrive while conserving as much water as possible.

HEALTHY PEOPLE, HEALTHY ENVIRONMENT

Change is on the menu at Rosehill College, as students tackle the problem of how to make their canteen food healthier, more affordable and less wasteful. They are working with public health specialists from AUT and food suppliers to explore and trial new foods and food packaging options.

HOMEGROWN TARO AND PLANTAIN FOR DINNER

"Is it possible to grow a bountiful, edible and nutritious crop of Japanese taro and plantain in south Auckland?" Enthusiastic student gardeners from Ōtāhuhu College are creating a school garden to test different methods for cultivating taro and plantain. They hope to grow bountiful vegetables that can be used to supplement their local community's diet with a nutritious and affordable backyard crop.

2022 NEW PROJECTS

KO AU TE AWA, TE AWA KO AU

Te Ararata Stream Team is developing the knowledge gained from their 2021 project (see pg 16) to investigate the impact of urban development on streams in Tāmaki Makaurau. They will continue to utilise a tuakana-teina approach to their learning, with older students teaching the younger ones how to determine a stream's health based on the biodiversity observed within it.

HEALTHY CONNECTIONS

Tamaoho School first opened its doors to learners in February 2021 and has already indicated a commitment to science education with a Curious Minds project investigating healthy eating choices. Students will design and build a garden they can use to grow their own vegetables before learning how they can be made into a healthy meal they can cook at home.

A SPOONFUL OF SUGAR

With rising concerns about sugar consumption by our youth, Tangaroa College students will research how they can monitor their sugar intake using H₂ breath monitors. Supported by scientists from the University of Auckland, students will investigate the variation in fructose absorption between students and how exercise can affect the ability to break down these sugars in the body. They hope to inform and encourage their peers to make healthier choices when in the soft drink aisle.

PULEGA OIL

"Why is coconut called the tree of life?" Tamariki at Puna o le Atamai Aoga Amata will investigate all things coconut with their Curious Minds funding. This project reconnects Aotearoa-based youth with a fruit that plays a huge part in traditional Samoan culture as they investigate how every aspect of the coconut — from the husk to the flesh — can be used in daily life.

WAI WE O TARA LEAD

During a previous project (see pg 9), Accelerating Aotearoa's rangatahi identified that raw sewage runs into their local awa in Ōtara every time it rains. To continue their investigation, Accelerating Aotearoa have partnered with Microsoft NZ to explore solutions to the wastewater overflow issue using artificial intelligence technology.

RECYCLE A DEVICE

Digital Future Aotearoa has received Curious Minds funding to grow community-led "RAD clubs" in three south Auckland high schools. Industry partners will support rangatahi to develop the tools and skills they need to diagnose, repair and refurbish old laptops, learning valuable tech skills along the way. This project aims to reduce the digital divide by giving new life to old technology and increasing digital accessibility.

ADOPT AN ECOSYSTEM

SAASIA is working with tamariki at Fetu Aolele Aoga Amata and Fetu Taiala Aoga Amata to learn about the interactions between biotic and abiotic organisms in ecosystems. Students will create terrariums to act as their ecosystem to observe, nurture and grow. This hands-on learning builds a connection between the students and nature, encouraging students to act sustainably both inside and outside the classroom.

eDNA MONITORING

Aorere College, along with council partners, has embarked on a ten-year plan to restore their local park and Waokauri Stream, which has been overrun with weeds and invasive species. Their Curious Minds funding will be used to investigate the efforts of cleaning up this waterway through eDNA monitoring and comparison with the biodiversity of other, relatively "pristine" streams in the vicinity.

DESIGNING SUSTAINABILITY GAMES

The Institute of Civil Engineers (ICE) is collaborating with three kura kaupapa in south Auckland to develop a board game centred around sustainability and kaitiakitanga. The project aims to introduce tamariki to the design thinking process by gamifying real world problems and raising awareness of resource constraints and climate change. As the tamariki "learn through play", they will be mentored by engineers, technology teachers and game designers to foster their interest in engineering and its applications in developing solutions to pressing world problems.

OUTCOMES SNAPSHOT

\$1 MILLION IN FUNDING AND COUNTING!

Since 2015, the Curious Minds south Auckland participatory science platform (PSP) has distributed over \$1 million to schools, community groups and universities to deliver innovative research projects in collaboration with STEAM professionals and community partners. In this special snapshot, we take a look back at what that funding has achieved — our reach and outcomes as told by our project participants.

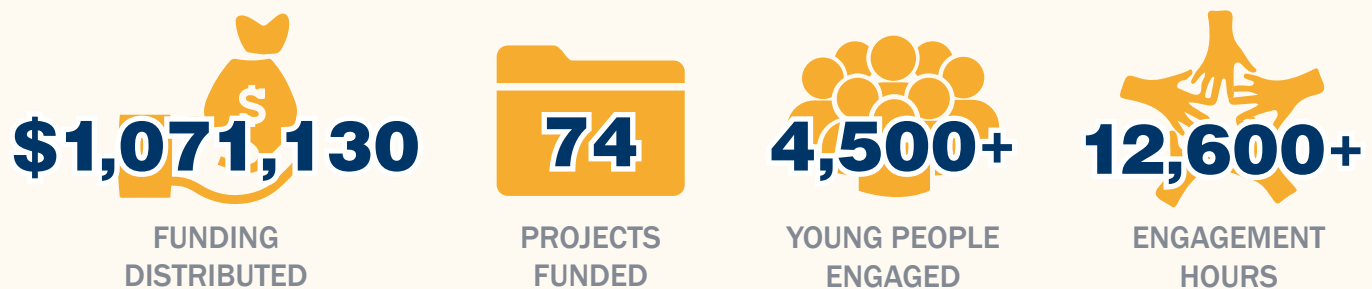
OUR OBJECTIVES

The PSP is a key action from *A Nation of Curious Minds – He Whenua Hihiri te Mahara*, the NZ Government's strategic plan for science in society. This plan sets out objectives and outcomes to increase STEAM engagement across Aotearoa NZ. The PSP is currently operating in south Auckland, Taranaki and Otago.

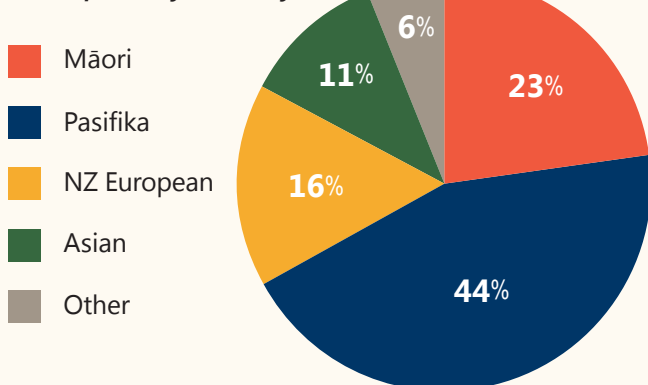
As the south Auckland region delivery partner, Te Hononga Akoranga COMET has strategic objectives to increase STEAM engagement and awareness across Tāmaki Makaurau and to foster and empower collaborations between south Auckland communities and the STEAM sector.

- Increase students' awareness of STEAM and STEAM careers
- Increase community engagement in STEAM
- Increase teacher confidence and capabilities in STEAM
- Support a more responsive, publicly-engaged STEAM sector

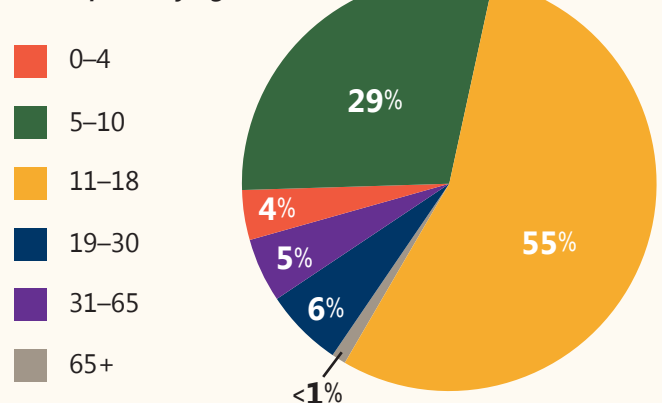
OUR REACH



Participants by ethnicity

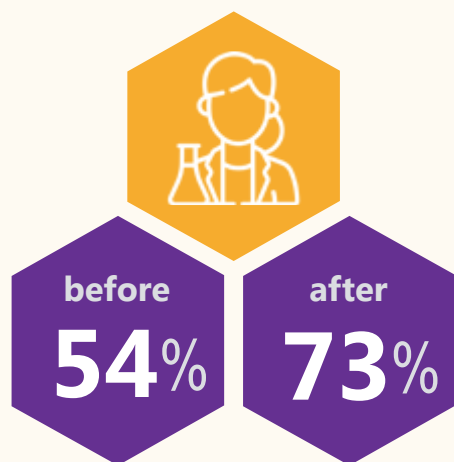


Participants by age

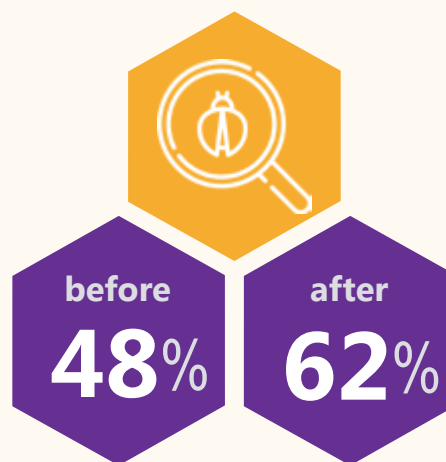


COMET measures outcomes through a combination of quantitative surveys, final reports and regular wānanga with project participants. This gives us valuable insights into the outcomes Curious Minds funding is supporting in our communities.

OUTCOME 1: INCREASED AWARENESS OF STEAM IN EVERYDAY LIFE AND STEAM CAREERS



"I have met a scientist."



"I have visited a zoo, museum or observatory or attended a science event in the last 12 months."

" *We learnt that mistakes are valuable and that problem solving is better with two heads than one.*

Year 7 student, Southern Cross Campus
Robotic Roller Coaster project (2019)

" *Taking part in the project has made our tauira think about what jobs they might like to aim for in the future.*

Judy Speight, Accelerating Aotearoa
Wai We o Tara Care project (2021)

OUTCOME 2: STRONGER SCIENCE ENGAGEMENT IN THE COMMUNITY

" *The project helped the social goals of our community by bringing our Pacific people together ... [and it] has improved the partnership between our community and scientists as our community's participation in science has increased.*

Tasi Poumale, McAuley High School
Pacific Wayfinding project (2019)



OUTCOME 3: GREATER TEACHER CONFIDENCE IN STEAM TEACHING AND GROWING COLLABORATIONS

" I think teachers seeing projects happening has helped them step out of their comfort zone in the teaching of STEAM.

Donna Lougher, Southern Cross Campus
Robotic Roller Coaster project (2019)



73%
of teachers
would recommend
Curious Minds

76%
of teachers
changed practice
after project

OUTCOME 4: A MORE RESPONSIVE SCIENCE AND TECHNOLOGY SECTOR



" Our mentors treasure their role in sparking wonder and making STEAM accessible and relatable. In turn, the kids of south Auckland inspire them and remind them how much fun science can be.

Alicia Evans
Fisher & Paykel Healthcare



200+
STEAM experts
engaged

" We found the work with the [Manurewa High] students to be really important and would love to get involved with similar projects again in the future.

Krystal Alferez
Auckland Council



\$390k
in co-funding /
in-kind support

NEXT STEPS

Curious Minds has successfully increased awareness of and engagement in STEAM throughout our communities in south Auckland. We have also increased teacher confidence and are changing the way teachers practise, resulting in long-term benefits for many students beyond the reach of our projects.

Our inaugural outcomes analysis has shown that Curious Minds is on the right track in south Auckland. We are making a difference!

Going forward, we will focus on extending STEAM opportunities to more students; championing local voices and local knowledge; and fostering deeper collaborations between participants, their whānau and the STEAM sector.

STEM ALLIANCE AOTEAROA

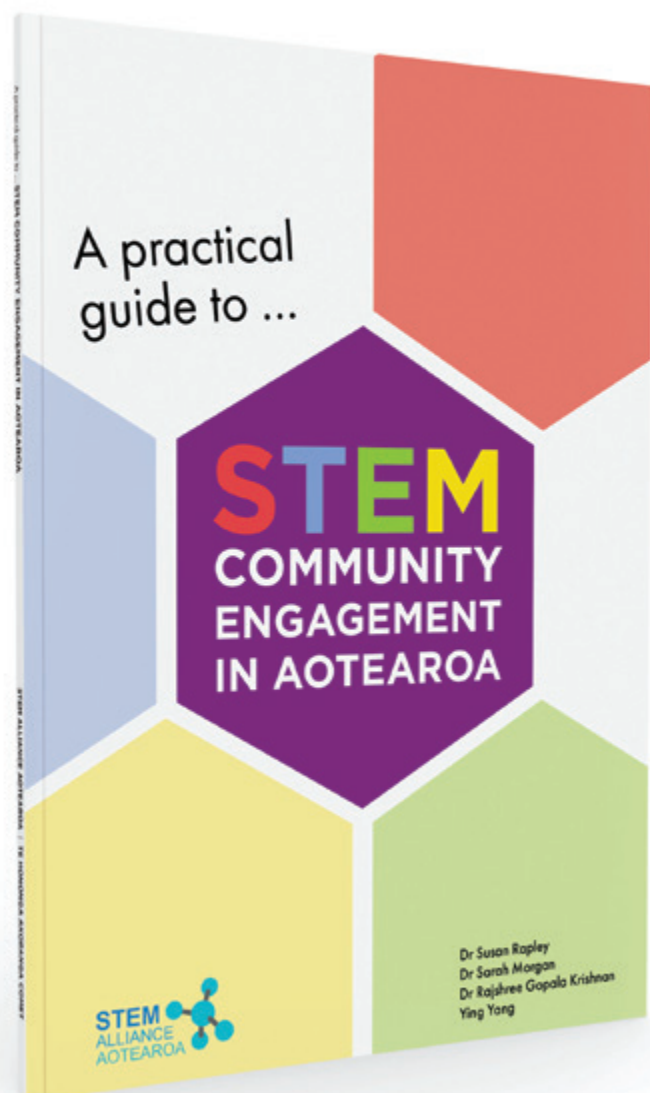
The Curious Minds participatory science platform has consistently shown the value of community and science partnerships for creating engaging opportunities for students to explore science, technology, engineering, maths and mātauranga in real-world contexts.

Successful project collaborations rely on a wide range of stakeholders coming together — students, educators, community members, businesses, academics and families.

The STEM Alliance Aotearoa network was created to strengthen these connections across the STEM sector. We provide resources, connections and advice to support businesses, educators and community facilitators to improve outreach and engagement across the STEM education system. Our vision is for a diverse and equitable STEM-literate Aotearoa NZ.

We know that community outreach and engagement initiatives work, but it takes effort. *A Practical Guide to STEM Community Engagement in Aotearoa* (see below) is an easy-to-use, research-based response to this challenge.

NEW BOOK RELEASE!



This three-part guide offers advice, tools and guidance to help educators, community facilitators and STEM professionals collaborate to show young people the value of science and technology.



Get your copy today at
www.stemalliance.org.nz/stembook



Te Hononga Akoranga COMET is an independent charitable trust and an Auckland Council CCO championing better and fairer education, skills and lifelong learning for all Aucklanders. We provide high quality and effective research, project development and leadership for cross-sector initiatives and action.

The participatory science platform is currently operating in south Auckland, Taranaki and Otago. It is an initiative under A Nation of Curious Minds, a government programme to encourage all New Zealanders to get involved with science and technology.

A Nation of Curious Minds is coordinated by the Ministry of Business, Innovation and Employment.

For more information, visit [CURIOUSMINDS.NZ](https://curiousminds.nz)



TE HONONGA AKORANGA
COMET



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HĪKINA WHAKATUTUKI