CRISiSLab Challenge

NZASE resource

This annual real-world, hands-on challenge is engaging students from the Wellington area. The scientists who run the challenge are keen to involve more girls and Māori students. Science Communicator Mike Stone talks with Dr Marion Tan and Alicia Cui.

CRISiSLab

This research and learning laboratory at Massey University Wellington is part of the Joint Centre for Disaster Research.

CRISiSLab focuses on five research areas – earthquake early warning, citizen science and crowdsourcing, artificial intelligence, communication technologies, and sensor design and development. Marion is the Research Manager, and Alicia is the Brand Manager.

As well as research, the lab website hosts activity resources for different levels on hazards, volcanoes, earthquakes and tsunami, and the lab organises a yearly student Challenge.

The CRISiSLab Challenge

This free competition is for all Wellington area secondary students; most entrants are in Yrs 11 or 12. Students are provided with some gear with which they work on the Challenge in their own time. Students work on their project at school, often as part of a club, at lunch times, for a few hours per week.

The Challenge launched in 2021. In previous years students had to create a device to give an early warning of an earthquake using seismometers. Some 2022 projects can be seen here.

This year students will design, assemble, and test a water pressure sensor system to detect waves in a wave tank, and display data on a computer screen. They present their systems on competition day.

A tsunami simulation tank, CRISiSLab.

After registering in April, students attended a launch day in May where they were given their kits and learnt about the challenge, with some tips and information about some of the science involved. Submissions are due by August 20.

This challenge requires a range of skills:

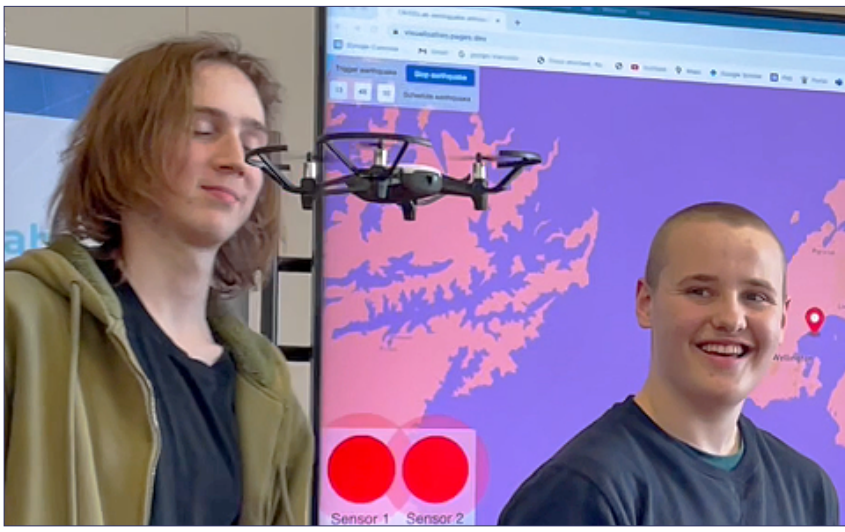
- Coding – students have to be able to use computer code to operate the sensor.
- Design – students use creativity to develop a solution to the challenge.
- Visual communication – students must display their data in a visually understandable way.

As scientists do, students need to work in teams to ensure they have all these skills.

The coding

The challenge kit includes a SparkFun pressure sensor and Microcontroller board and user guides, with cables, balloons to protect the sensor, and a container to use as a water tank.

Students can choose their own coding language, such as Python. The Arduino IDE app



Brendan Shaw and Lev Petersen from Wellington High School with their drone in 2022.

can be used to make it easy to write code and upload to the board. This enables students with low coding skills to participate, although it does help if there is a person at school who can provide technical support.

Students are given step-by-step guidance and fortnightly targets (eg, get readings from their sensor, be able to graph the data, convert the data to a water height).

CRISiSLab provides technical and other support in fortnightly online sessions, and students can also chat on the Discord channel, a platform used by many gamers.

The prize

On the final demonstration day, August 22, all the school teams will gather at Massey University to show what they have done. The projects are given awards for the best:

- Communication and presentation.
- Visual representation of data on the dashboard.
- Design and creativity.
- Ultimate winners who show the best in all three categories.

The winning team is offered an exclusive Summer Internship to work at the lab for six weeks over the summer, on a project related to their entry. Last year's interns also helped design this year's challenge.

Why get involved?

"Students relish the opportunity to get really hands-on with a real-world problem," says Alicia Cui. "Earthquakes are a real issue for us here in Wellington, so it's about us." Marion Tan adds: "They also enjoy interacting with their team and students from other schools; it is all very engaging."

Te Kura Māori o Porirua has participated for three years, integrating Mātauranga Māori into the science and technology. CRISiSLab is reaching out to individual schools to involve more Māori and girls in this competition.

If you want to get involved, or be at the demonstration day, email Alicia or join their mailing list.

Ngā Kupu

Hoahoa ~tia – Design (technology)
Kauwhata – Graph
Paerongo – Sensor
Pēhanga – Pressure
Raraunga – Data; database
Rū – To shake; earthquake
Rūpaku – Tremor
Tai āniwhaniwha – Tsunami
Waehere – Computer code
Whakatara – Challenge.

Te Aka Maori Dictionary and *Paekupu*

Team She Can from St Mary's College in Wellington co-won the best presentation at the inaugural Challenge in 2021. Photo: CRISiSLab.