Wonder Project

WHERE SCIENCE TECHNOLOGY ENGINEERING AND MATHS COME ALIVE.

Rocket Challenge 2023
Impact report

engineering new zealand te ao rangahau

POWERED BY CallaghanInnovation New Zealand's Innovation Agency

Contents

Spreading STEM wonder

Reach

The Rocket Challenge had its biggest year yet in 2023, surpassing the goal of 800 classes substantially. We reached around 27,000 students across 938 classes in 499 unique schools. 350 of those classes were matched with Wonder Project Ambassadors (37% of participating classes), from a pool of 271 STEM professionals. We had an additional 108 ambassadors register to take part who we were unable to match due to regional differences or term preference for running the challenge.

	2018	2019	2020	2021	2022	2023
Students*	841	12,760	19,198	18,067	16,095	27,202
Classes	29	440	662	623	555	938
Schools	29	200	439	360	290	499
STEM professionals	55	456	472	377	277	271

**Based on average of 29 students per class*

The Ministry of Education student data from 2022 shows there were 129,058 students in Year 5–6 and 1,825 schools for this level. In 2023 we estimate to have reached around 21% of the available student market at 27% of target schools.

Around
27,000
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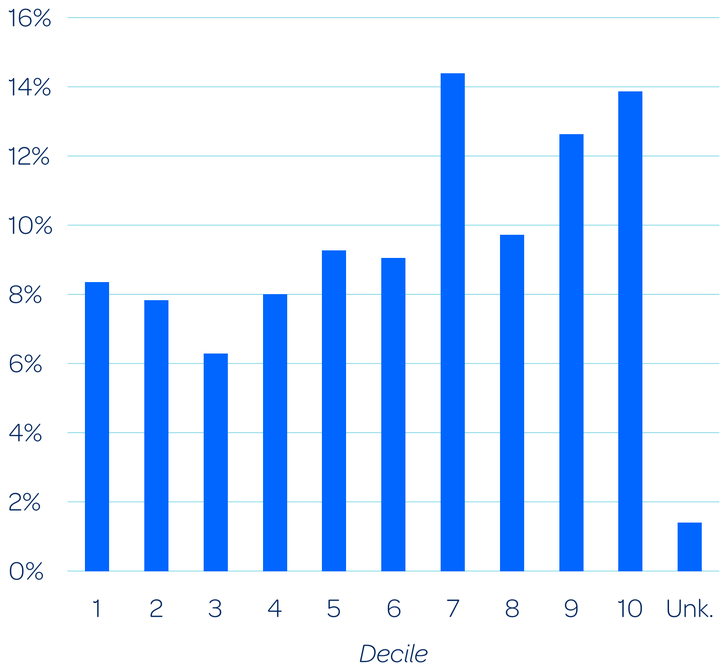
Demographics

Decile

In 2023 we had a goal to increase the participation of schools between decile 1–7 by 10% on the previous year. We had an 82% increase in decile 1–7 classes, with 63% of participating classes sitting within that range.



As decile is no longer used, we will move to the new Equity Index (EQI) model from 2023 onwards. This is an important metric to measure equitable access and focus on schools with larger socio-economic barriers.

Ethnicity

We achieved our goal to reach 15% Māori and 8% Pacific Peoples, at 24% and 9% respectively.

- Pākehā/other, 67%
- Māori, 24%
- Pacific Peoples, 9%

Region

We had 51% of participating schools in the main centres (Auckland, Wellington and Canterbury), and 49% across the regions.

- Auckland, 31%
- Canterbury, 12%
- Waikato, 10%
- Wellington, 8%
- Bay of Plenty, 7%
- Manawatu-Whanganui, 6%
- Otago, 5%
- Hawke's Bay, 4%
- Northland, 4%
- West Coast, 3%
- Southland, 2%
- Taranaki, 2%
- Tasman, 2%
- Gisborne, 1%
- Nelson, 1%
- Marlborough, 1%
- Queenstown, <1%

Impact in short

77% **students** said the Rocket Challenge **made them feel more confident** in STEM subjects

53% **students** were **more interested in STEM jobs** after the challenge

81% **students** said they **would do it again**

99% **teachers** **would recommend** the programme to others

95% **teachers** **enjoyed teaching** the Rocket Challenge

98% **teachers** said they **would do it again**

87% **teachers** noticed a **positive shifts in students' perceptions** of STEM

94% **teachers** **increased their confidence** in teaching STEM

92% **teachers** said **students were engaged** with the programme

96% **ambassadors** **would recommend the experience** to others

Pre and post surveys

Before doing the challenge, students and teachers are asked to complete a survey to understand their perceptions of and confidence in STEM. They repeat this, with some additional questions, at the end of the challenge to measure the impact of the Wonder Project.

Survey completion rate

	Pre	Post
Student	10,292	1,997
Teacher	329	163
Ambassador	–	94

I could have been having the most busy or stressful day at work, then I'd do a Wonder Project session and I'd leave the school feeling super stoked. The students were all so excited to be involved, it really felt like I was making a difference.

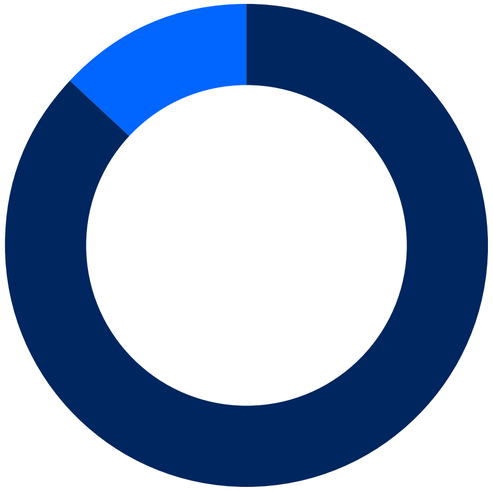
Logan Holden-Boddy,
Ambassador – Stantec

Student experience

Perceptions

STEM perception

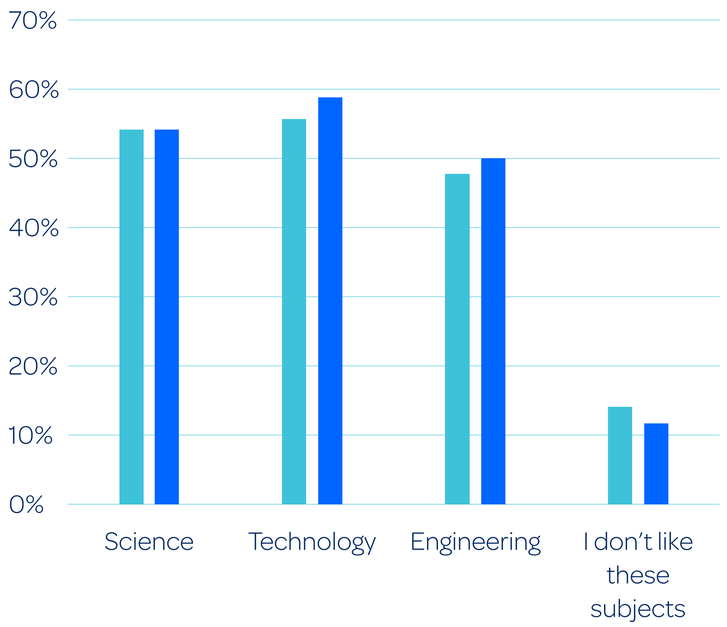
When teachers were asked if they noticed a shift in their students' perceptions towards STEM over the challenge, 87% said they noticed a positive shift.



- Their perceptions changed positively, 87%
- Their perceptions didn't change, 13%
- Their perceptions changed negatively, 0%

STEM subject preference

We noticed an incremental change in STEM subject preference among participants. Interestingly, our data for 2021 shows an average of 30% of students starting the challenge liking each subject. This is now around 20% higher to start with across all subjects.



- Pre
- Post

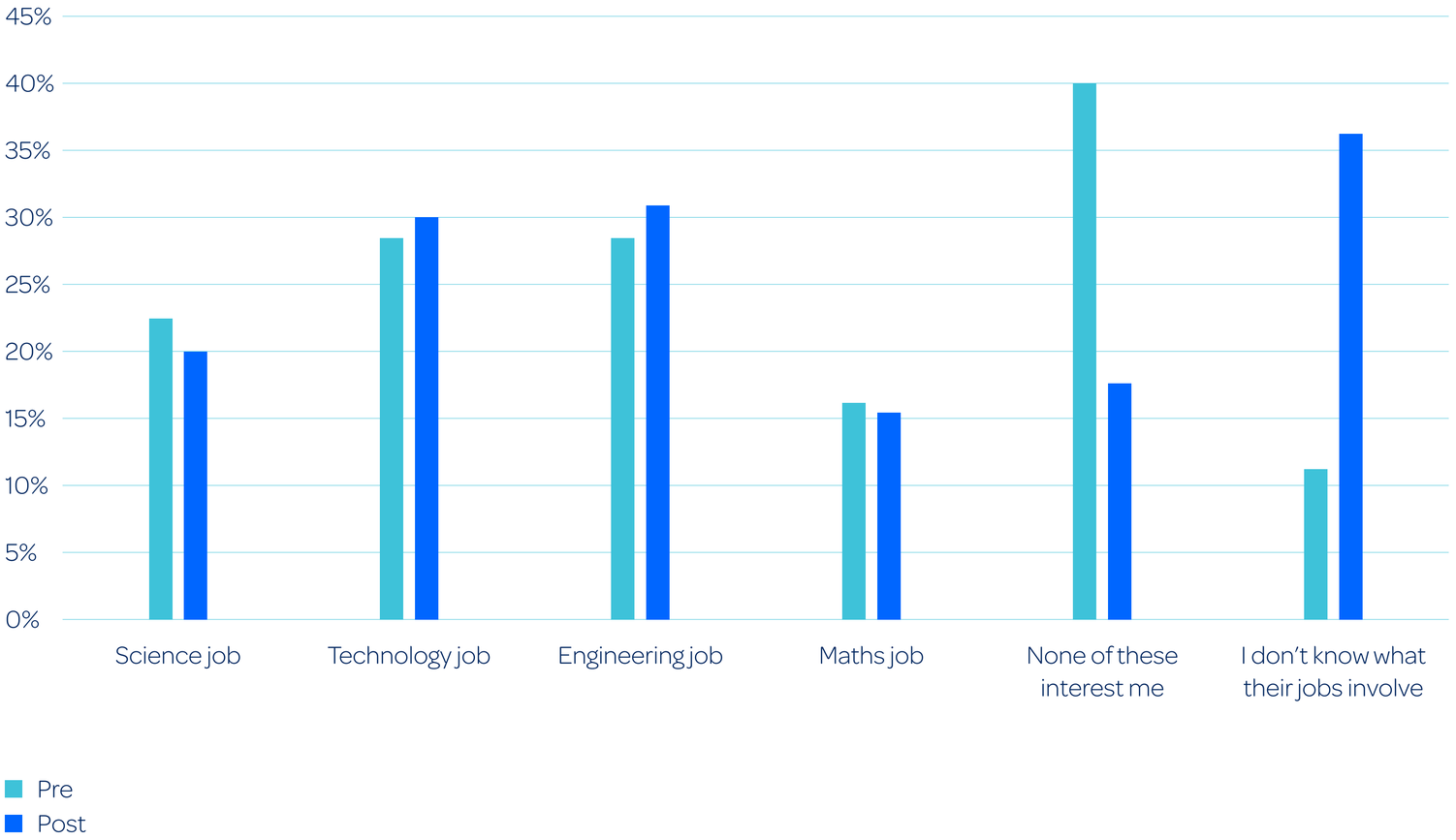
It is actually impossible to summarise the love, the passion, and the collaboration my ākonga showed for the Wonder Project Challenge. All the learning definitely aided my learners' kete – massive thank you!

Bhavana Mehta,
Teacher – Balmoral School

Job aspirations

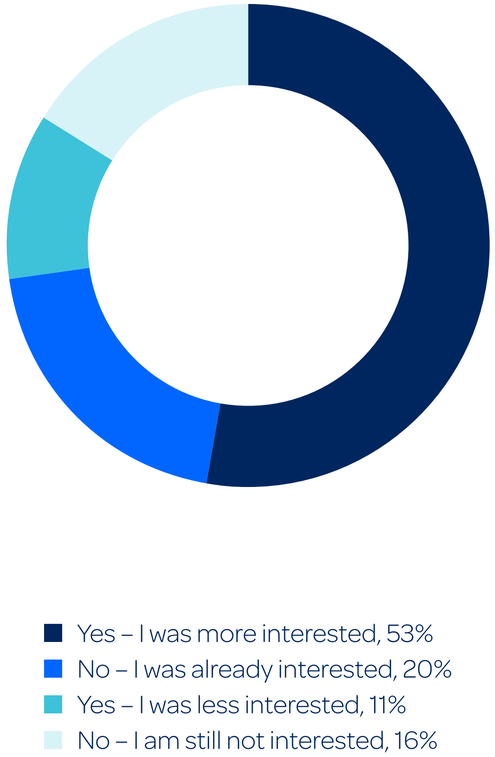
79% of teachers believed their students were more curious about the opportunities that different careers in STEM can provide, after the challenge.

From students, we saw more curiosity in STEM careers, with a drastic decline in those saying none of these jobs interest them. We also saw a slight increase in aspirations towards engineering and technology jobs after the challenge.



Interest in STEM jobs

More than half of students reported that they were more interested in STEM jobs after completing the challenge. With a further 20% of students already interested n STEM jobs, post the challenge, 73% of students would consider a STEM career.



Confidence

STEM subject confidence

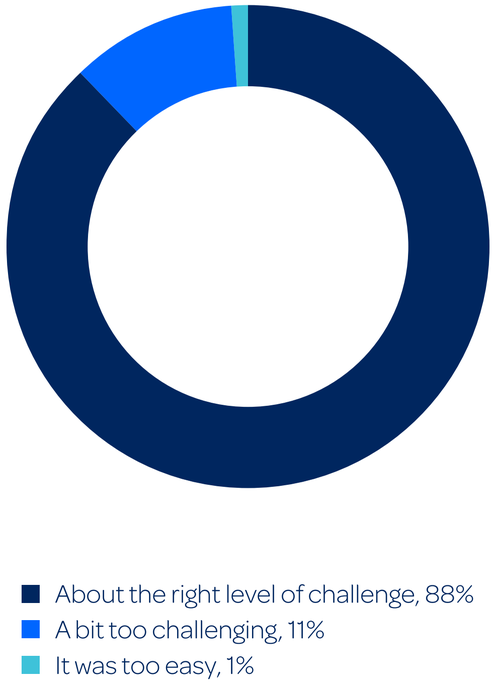
When asked if taking part in the challenge made them feel more confident in STEM subjects, 77% reported that it did.

When asked about confidence across each subject, we saw a slight shift overall with more moving into the 'fairly confident' category from being 'not confident'.

Knowledge and skills

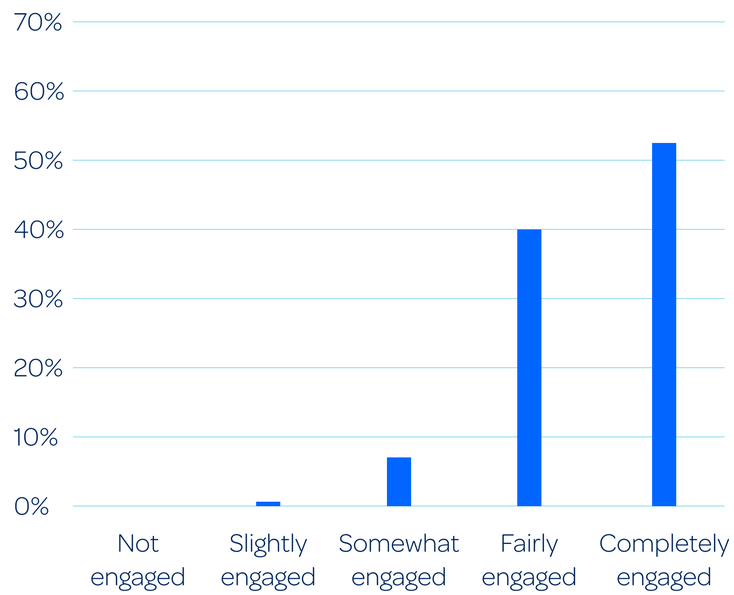
Level of challenge

Most teachers said students were challenged by the learning material at about the right level.



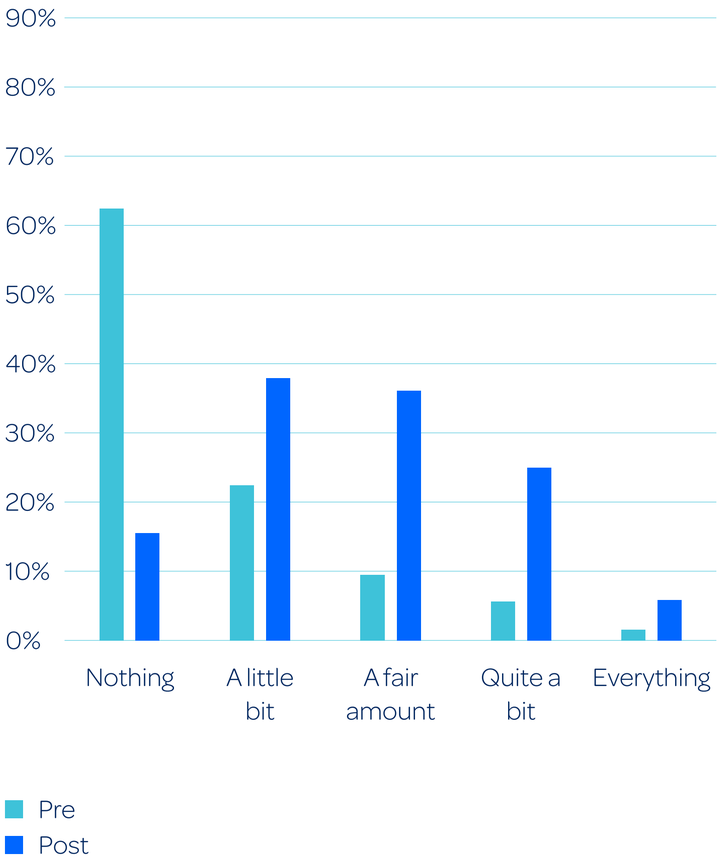
Engagement with learning

Teachers reported that 92% of their students were fairly or completely engaged with the learning journey.



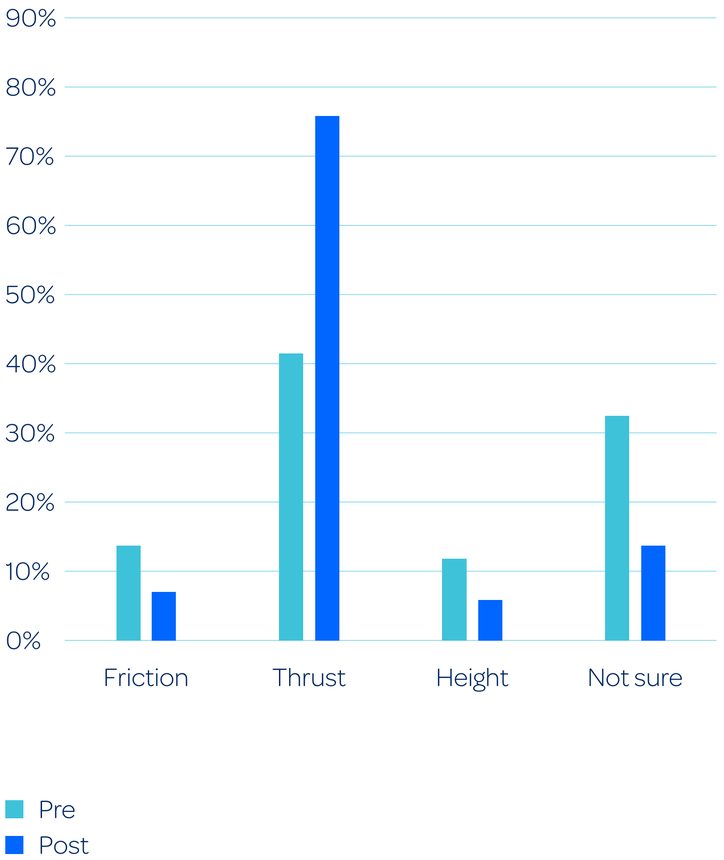
Newton's laws of motion knowledge level

We saw a positive shift in what students knew about one of the key learning outcomes, Newton's laws of motion.



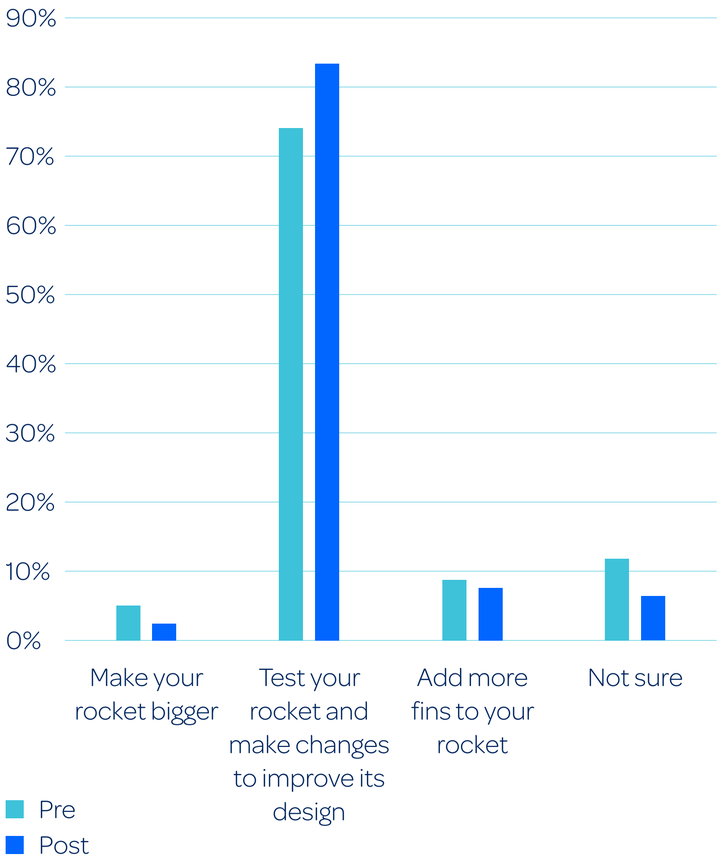
Force of flight

Before the challenge, 42% of students could correctly identify thrust as a force of flight. After the challenge this rose to 76% of students, an 81% increase.



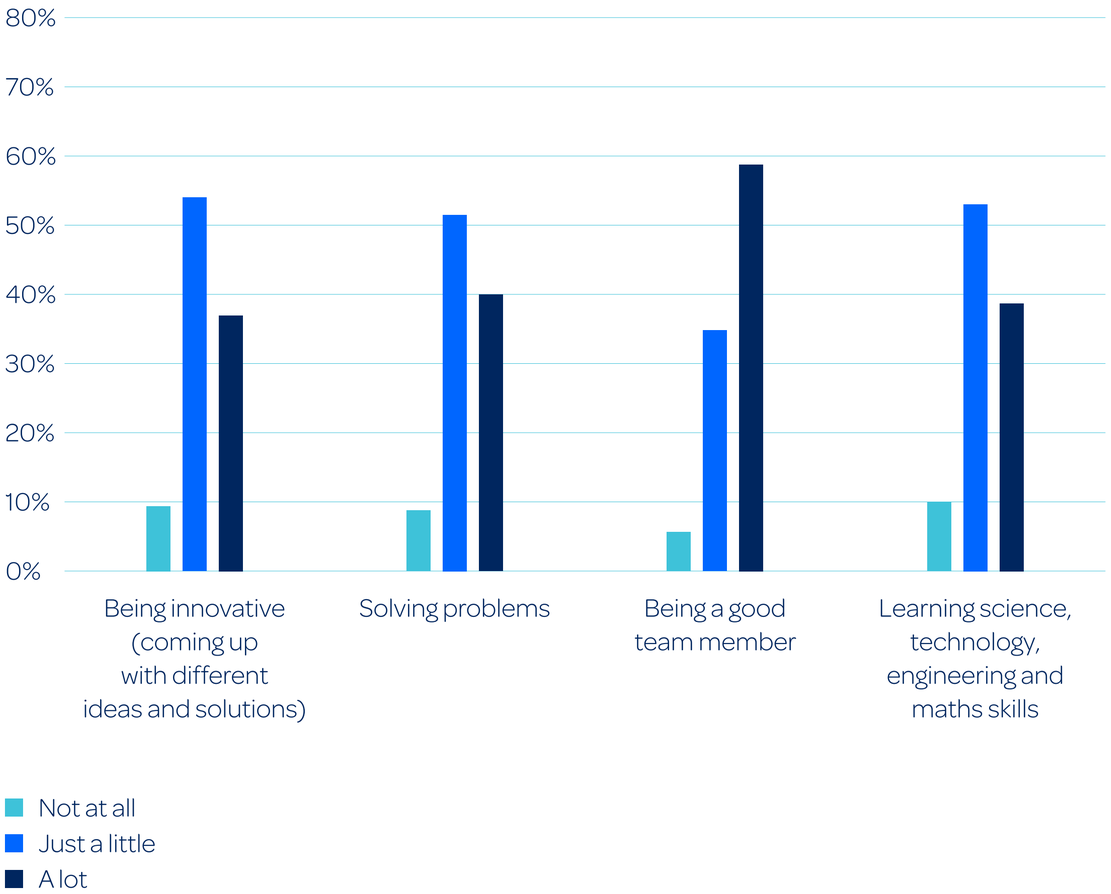
Engineering design process

Before the challenge, 74% of students could correctly identify testing and improving their rocket as the best way to get it to fly higher and further. After the challenge this rose to 84% of students, a 14% increase.



STEM skills practiced

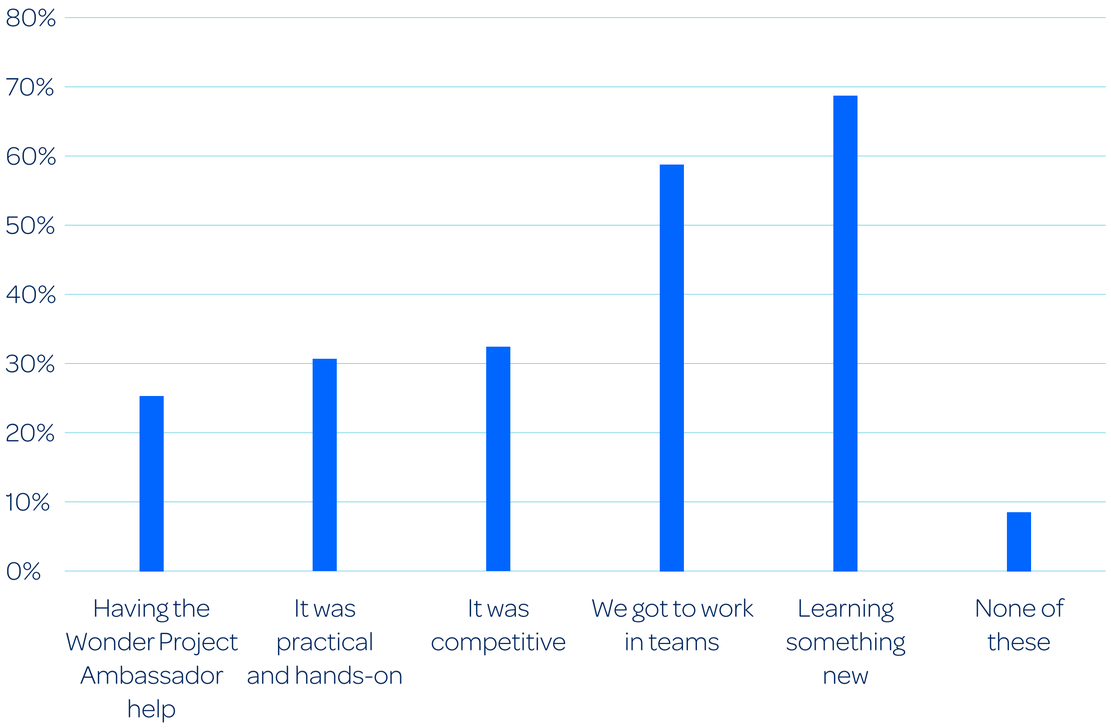
During the challenge, we expect students will learn about and practice four key STEM skills. The majority of students were exposed to these and could identify that they'd been able to practice them. Teamwork was a stand-out, with 59% of students saying they practiced this skill a lot. 95% of teachers also said there were lots of opportunities for students to discover and develop STEM skills.



Enjoyment

What they liked

From their Wonder Project experience, students mostly valued learning something new and working in teams, when asked what they enjoyed about the challenge.



Take part again

81% of students said they would like to take part in another Wonder Project challenge as part of their school work.

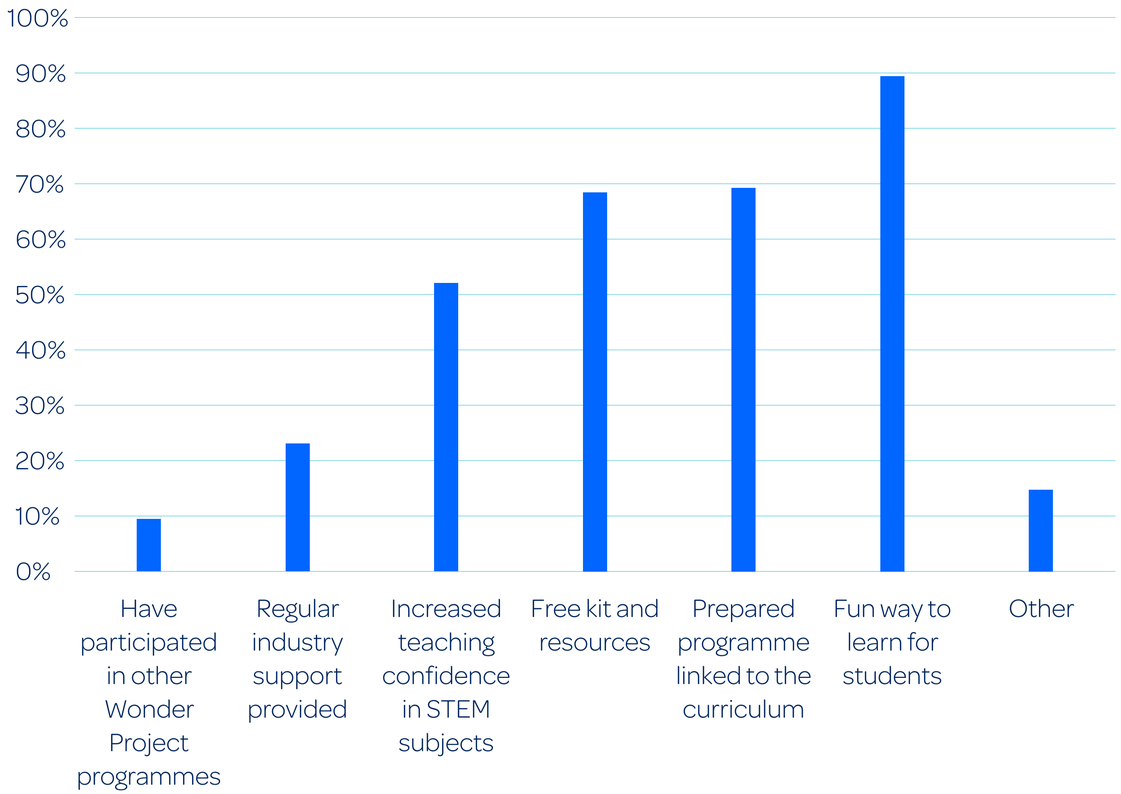
81% students said they **would do it again**

Teacher experience

Registering

Motivation to sign up

Teachers primarily registered for the Rocket Challenge because it looked like a fun way for their students to learn. Having a prepared programme linked to the curriculum, the free kit and resources, and increasing their confidence teaching STEM were also predominant reasons they signed up.

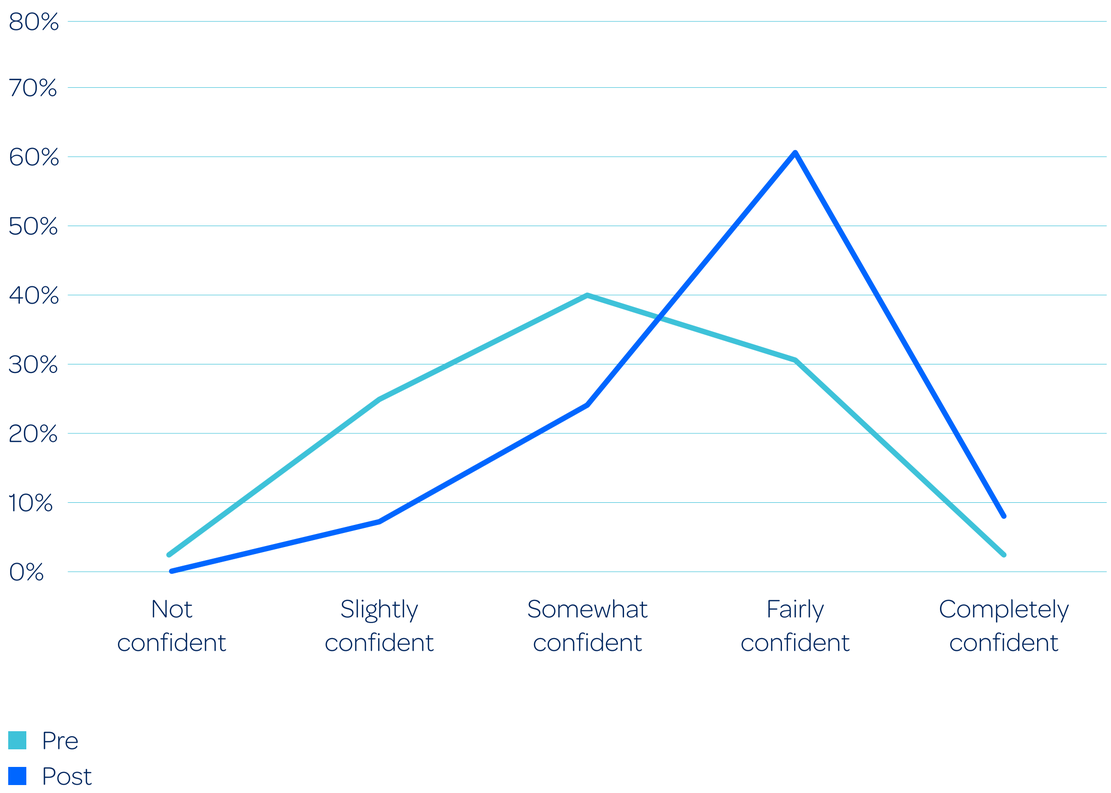


Confidence

Teaching STEM subjects

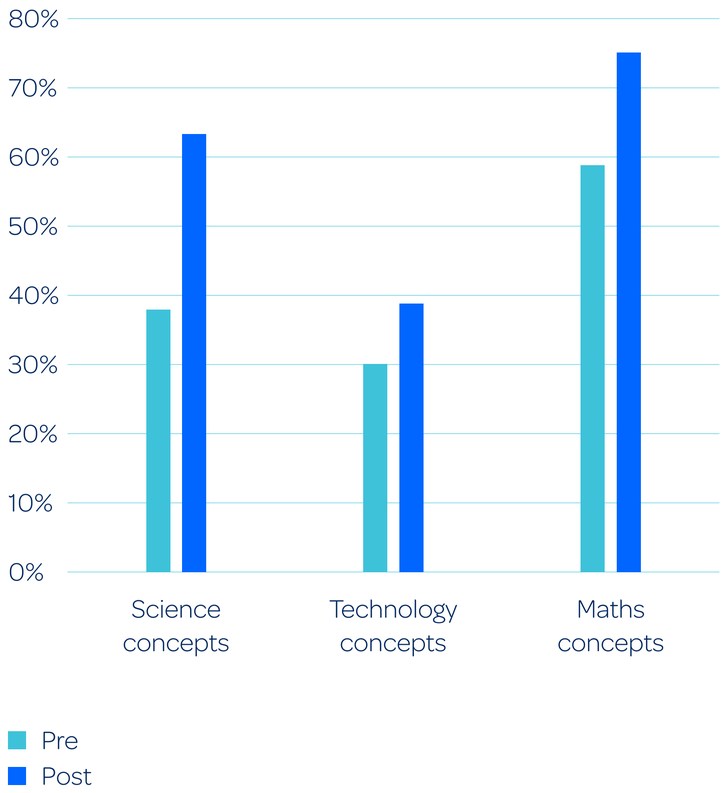
When asked if they felt participating in the challenge has increased their confidence in teaching STEM, 94% of teachers agreed.

We had a 109% increase in teachers feeling fairly or completely confident teaching STEM subjects.



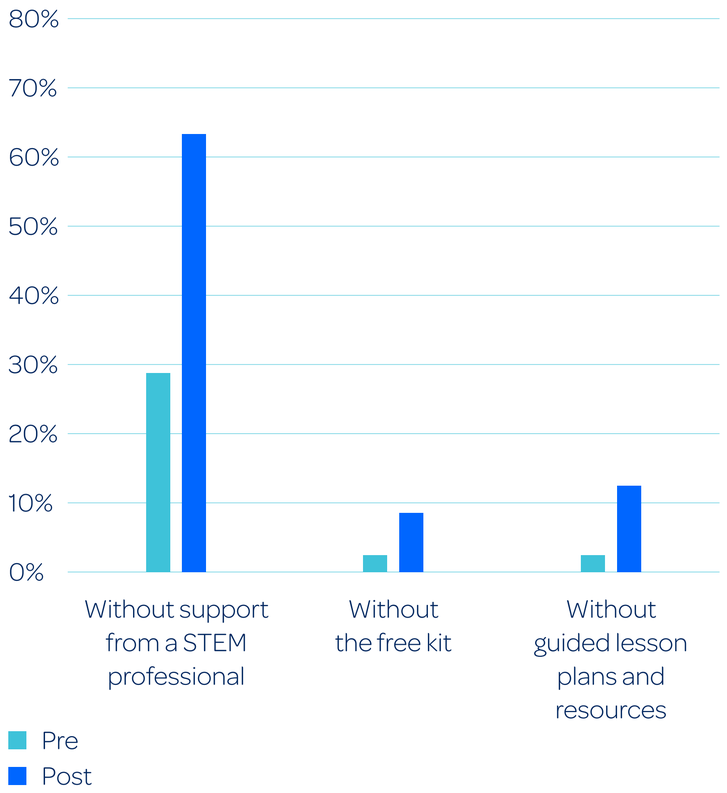
Demonstrating STEM concepts

There was a 40% increase in teachers feeling fairly or completely confident demonstrating STEM concepts overall. The largest increase was for science concept demonstration.



Wonder Project support

When asked how confident teachers would feel funning the challenge on their own and without various aspects of support provided by the Wonder Project, we noticed that teachers still value the free kit and lesson plans post the challenge. They do feel more able to run the challenge without support from a STEM professional, which aligns to their increase in confidence teaching STEM subjects and demonstrating concepts.



Ākonga and kaiako were all equally inspired, excited and totally engaged in such rich learning experiences that literally blew our minds – mīharo!

Rachael Tangneg,
Teacher – Bankwood School

Challenge content

94%
teachers

said the challenge was **well structured and paced to support student learning and agency**

Structure and pace

89%
teachers

said the online Learning Hub **was helpful, easy to use and navigate**

Online Learning Hub

92%
teachers

were fairly or completely **satisfied with the teaching content**

Teaching content

91%
teachers

were fairly or completely **satisfied with the student module content**

Student module content

Enjoyment

95%
teachers

said they had a **great experience teaching** the Rocket Challenge

Experience teaching the challenge

99%
teachers

would recommend the Wonder Project to other teachers

Recommendation

98%
teachers

said they'd **take part in another Wonder Project challenge** based on their experience

Take part again

Ambassador experience

Challenge content

Teaching content

79%
ambassadors

were **fairly or completely satisfied** with the teaching content

Enjoyment

Recommendation

92%
ambassadors

would recommend others become Wonder Project Ambassadors

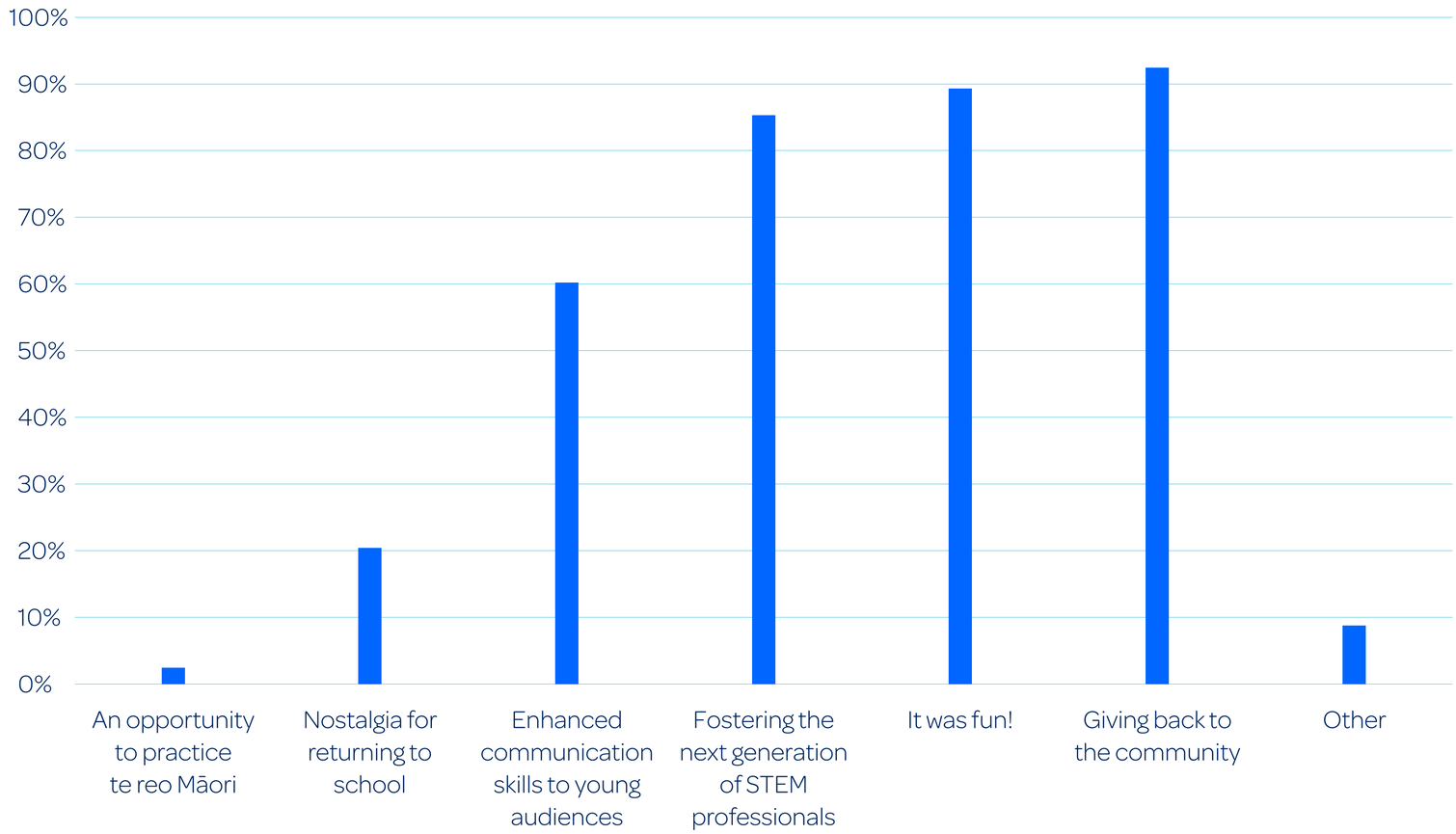
Take part again

82%
ambassadors

said they'd **like to be involved again**

Benefits

Ambassadors rated giving back to their community, having fun and fostering the next generation of STEM professionals as the top things they gained from being part of the Wonder Project.



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