

# I wonder how rockets fly?



Wonder  
Project

Rocket  
Challenge

The Wonder Project is Engineering New Zealand's not-for-profit, free programme for schools, designed to inspire young Kiwis with science, technology, engineering and maths (STEM).

The Wonder Project is a series of project-based hands-on programmes that knit seamlessly into the New Zealand school curriculum. They're designed to spark wonder and awe in young Kiwis from Year 5–13 and get them excited about a future STEM career.

## Rocket Challenge

Level 3 | Phase 2, Year 5–6  
Term 2

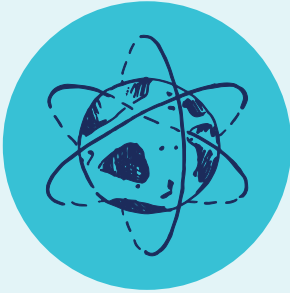
Houston, we have lift off! Ākonga blast off into STEM by designing, building and launching a water rocket. They'll learn about Newton's laws, the engineering design process, and working as a rōpū.



engineering  
new zealand  
te ao rangahau

## Rocket Challenge

Starting anytime in Term 2 each year, the Rocket Challenge provides scaffolded learning aligned to Level 3 or Phase 2 of the New Zealand school curriculum. The challenge takes around 12–16 hours to complete across 6–8 weeks, or longer if required. It's also possible to complete the challenge in a more condensed timeframe.



Newton's laws of motion



Rocketry



Teamwork



Physics concepts



Engineering design process

### What we offer schools

- Online training on core STEM principles
- Ākonga learning material and activities
- Detailed lesson plans and support notes
- Where possible, support from a volunteer STEM professional (online support available)
- Free rocket kit with all the gear
- Online community of kaiako and ambassadors
- Resources to assess ākonga on their challenge learning

### Our impact

Here's what participants said about the 2024 Rocket Challenge:

- 96% of kaiako increased their confidence teaching STEM
- 98% of kaiako and 80% of ākonga said they would do it again
- 56% of ākonga were more interested in STEM jobs after the challenge
- 93% of kaiako said ākonga were engaged with the programme

Become a wonder school today at [wonderproject.nz](https://wonderproject.nz)

   @WonderProjectNZ

Te reo Māori  
ākonga  
activities also  
available

## Rocket Challenge modules

### Module 1

Get ready for the Rocket Challenge, meet your Wonder Project Ambassador, and find out how the engineering design process can help launch a rocket.

### Module 2

Explore what rockets need to get off the ground, understand the health and safety rules for launches. Launch your first test flights and play with variables.

### Module 3

Learn about Newton's first law of motion, the forces acting on a rocket and start designing the ultimate rocket.

### Module 4

Explore Newton's second law of motion, understand the key features on a rocket, and develop a prototype based on designs.

### Module 5

Learn about Newton's third law of motion, launch your second test flights with prototype rockets and record data about each launch.

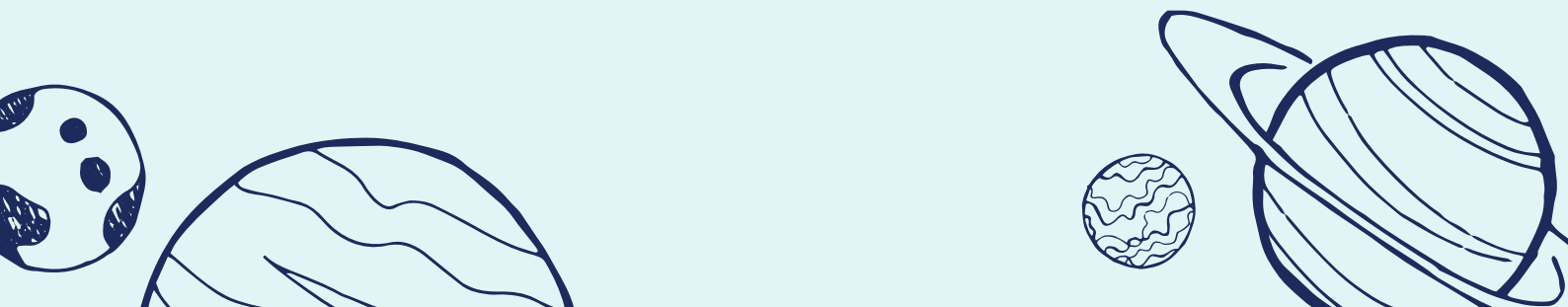
### Module 6

Analyse test flight data to improve on rocket designs, launch your best rocket for the final blast-off, and celebrate and share your Rocket Challenge journey.

## Achievement objectives

Kaiako can also make wider curriculum links to other achievement objectives depending on ākongā level and individual learning programmes.

Achievement objectives	Ākongā will	Curriculum level/phase	Year level
<b>Science:</b> Physical world	<b>Physical inquiry and physics concepts</b>  Identify and describe how movement and forces effect the motion of rockets.	Level 3	5–6
<b>Technology:</b> Technological knowledge	<b>Technological modelling</b>  Undertake functional modelling of rocket prototypes to inform decision making.  Evaluate rocket prototype fitness of purpose to refine further developments.	Level 3	5–6
<b>Mathematics and statistics:</b> Geometry and measurement	<b>Measurement and shape</b>  Represent rockets through drawings and models.  Use metric units to find length, volume, weight (mass) of the rockets and the angle of rocket launch.	Level 3 Phase 2	5–6



# I wonder how we get rangatahi excited about STEM?

Engage your ākonga in the wonders of STEM by registering for one of our hands-on, project-based challenges.



## Rocket Challenge

Level 3 | Phase 2, Year 5–6  
Term 2

Houston, we have lift off! Ākonga blast off into STEM by designing, building and launching a water rocket. They'll learn about Newton's laws, the engineering design process, and working as a rōpū.



## Power Challenge

Level 4 | Phase 3, Year 7–8  
Term 3

Power up! Ākonga design and build a wind turbine and work as a rōpū to light up their own mini town. Along the way they discover the amazing phenomenon of electricity and renewable energy.



## Water Challenge

Level 4 | Phase 3, Year 7–8  
Term 3

Ready, set, flow! Ākonga construct and test a mini model of Aotearoa New Zealand's wai network. They'll explore the journey of wai and how STEM is used to collect, clean, connect and care for one of Earth's most precious taonga.

---

Showcase the immense possibilities of a future in STEM.



## STEM Careers

Year 7–13  
Year round

The future is bright! Ākonga are inspired to keep taking STEM subjects, and given a taste of the real world with industry visits and motivating career talks from STEM professionals.

Become a wonder school today at [wonderproject.nz](http://wonderproject.nz)

   @WonderProjectNZ