

YEARS 5-8

Rocket Power

Whakarewatanga Tākirirangi



OVERVIEW

Discover the science behind the rocket power in this hands-on learning experience. Students will learn about flight, gravity and the chemical reaction causing the rocket to 3,2,1...blast off!

NZ CURRICULUM LINKS

LEARNING AREAS:	ACHIEVEMENT OBJECTIVES:	LEVELS:	YEARS:
Science: Physical world: physical inquiry and physics concepts.	Explore, describe and represent patterns and trends for everyday examples of physical phenomena, such as movement, forces, electricity, light, sound, waves and heat.	3-4	5-8
Nature of science: Investigating in science.	Develop and carry out more complex investigations, including using models.	3-4	5-8
Technology : Technological knowledge: technological modelling	Understand that different forms of functional modelling are used to inform decision making in the development of technological possibilities and that prototypes can be used to evaluate the fitness of technological outcomes for further development.	3-4	5-8

TEACHER INFORMATION:

Learning sequence



INTRODUCING
KNOWLEDGE



EXPLORE AND
INVESTIGATE



CREATE AND
SHARE



REFLECT AND
EXTEND



MAKE A
DIFFERENCE

Learning intentions

Students are learning to:

- Explore and describe concepts surrounding flight including forwards thrust and gravity
- Understand the chemical reaction between baking soda and vinegar and gas molecules
- Design and evaluate their own rocket for flight

Success criteria

Students can:

- Explain what happens to a baking soda rocket when the chemicals are combined
- Describe forwards thrust and the impact of gravity on the rocket

Resources needed

- Slideshow: [Rocket Power](#)
- [Student worksheet](#)
- Safety glasses, recycled plastic bottle, 3 paper straws, cork, baking soda, vinegar, tape, decorative material e.g.coloured paper, tape, glue
- Devices, internet access

Additional Support

School-gen Fun Activity: [Film Canister Rocket](#)

How to Make a Bottle Rocket: [Arm and Hammer Instructions](#)

Arm and Hammer Video: [Blast-Off Bottle Rockets](#)

Science Sparks: [Baking Soda Rocket](#)

Vocabulary

Carbon dioxide, upward thrust force, gravity, chemical reaction, weight, drag, lift.

LEARNING EXPERIENCE

Note: These are suggestions only and teachers are encouraged to adjust the activity to suit the needs and interests of their students.



INTRODUCING KNOWLEDGE

Allow approximately 25 minutes

- View the **Rocket Power** slideshow and introduce learning intentions on slide 2.
- Complete the Think, Pair, Share activity on slide 3 around the focus questions to gather prior knowledge.
- Introduce slide 4, 'What is Gravity?' and complete the brainstorm activity. Record ideas.
- Watch the **video**, pausing regularly to discuss new vocabulary and ideas.
- Additional experiment to test out gravity on slide 5



EXPLORE AND INVESTIGATE

Allow approximately 25 minutes

- Explore the four concepts of flight on slide 6. Drag, weight, lift and thrust.
- Additional activity: Design and create paper planes to further explore concepts of flight in more detail.
- Discuss focus questions on slide 7 and record thinking. Depending on prior knowledge you may want to do this as a whole class activity or small groups.
- Listen to the Wonder Kids, short podcast (3:56) 'How does a rocket ship go into space?'

Any text highlighted in **orange** represents a link to further material. If you have printed this resource, please return to schoolgen.co.nz/teachers/resources/ to access the linked material.




CREATE AND SHARE

Time will vary - this may be done over the course of a few lessons or as a homework activity

- Create your own rocket model or artwork. There are plenty of instructions on how to design and construct a simple bottle rocket out of reusable materials. See the School-gen fun activity, [film canister rocket](#).
- Watch this [simple video](#) on the steps to making a baking soda rocket. Slide 9. Check out the additional support links for more ideas.
- Briefly explain that the reaction between the baking soda and vinegar will cause a build up of gas that will force out the cork and be the source of fuel that thrust the rocket upwards.
- Share ideas about how each model or artwork will launch into the air.
- Complete the [student activity worksheet](#) for students to make their predictions prior to launching and evaluate after.

Student worksheet



My predictions

	What I think will happen	What actually happened
What do you think will happen when you mix the baking soda and vinegar inside your rocket?		
How do you think gravity will impact your rocket?		
Do you think your rocket is strong enough to land without breaking? Why or why not?		





REFLECT AND EXTEND

Allow approximately 20 minutes

What caused your rocket to launch?

- Discuss slide 10 and explain the chemical reaction in greater detail.
- Discuss slide 11 'The science behind the launch...'

THINKING LIKE A SCIENTIST:

If your rocket didn't launch, or didn't launch very high, can you explain why using your knowledge of the chemical reaction that occurred?



MAKE A DIFFERENCE

Allow approximately 15 minutes

Rockets and space exploration can produce a lot of waste products.

They can create lots of pollution with each launch.

- Research some space programmes and discover how they might be trying to combat the waste production they cause.
- Can you make any suggestions on these programmes?
- Discuss with your class if you think space exploration and travel is important in your opinion.

We hope you have enjoyed this educational STEM resource.

School-gen is a Genesis community initiative to get kaiako, tamariki and whānau enthused about STEM.

For more free resources please visit our [Genesis School-gen website](#) and follow us on Facebook and Instagram @schoolgennz