Royal Academy of Engineering

THIS IS ENGINEERING

ENGINEERING *IN THE* MOVIES

POP ROCKETS BLAST OFF

STEM

Science, Technology and Engineering Focus

INTRODUCTION

APOLLO 13 (1995) is about the third Moon-landing mission. An onboard explosion deprives the rocket of most of its oxygen supply and electric power, forcing NASA to abort the Moon landing and turning the mission into a struggle to get the astronauts home safely.

The filmmakers went to great lengths to ensure that the depiction of the launch of the rocket was technically accurate. Watch the scene at **https://www.youtube.com/watch?v=lMtWWls4oas**

But how do you get a rocket to take off? This pop rocket challenge will show you how a chemical reaction occurs when you mix things together to make cool things happen.

Science History Images / Alamy Stock Photo

OVERVIEW

Launch your own rocket into space by mixing acid and water to create gas.

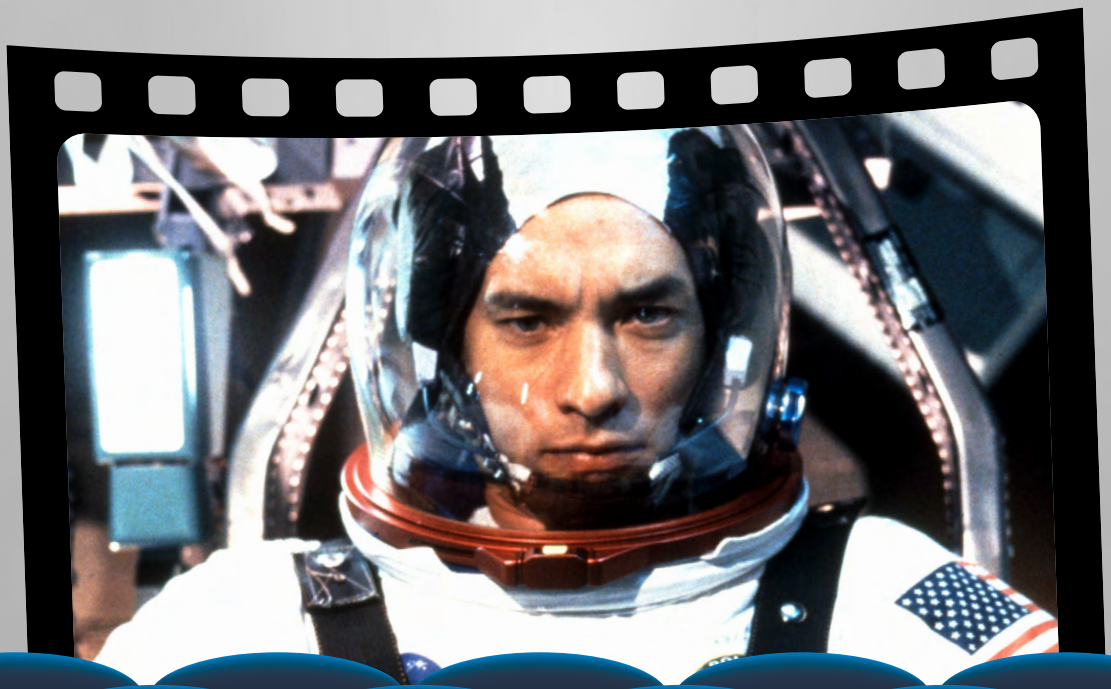
When gas is in a small space, you get pressure. Pressure equals blast off!

CHALLENGE

- Teams of two
- 60 minutes
- KS2/3
- Apprentice

MATERIALS

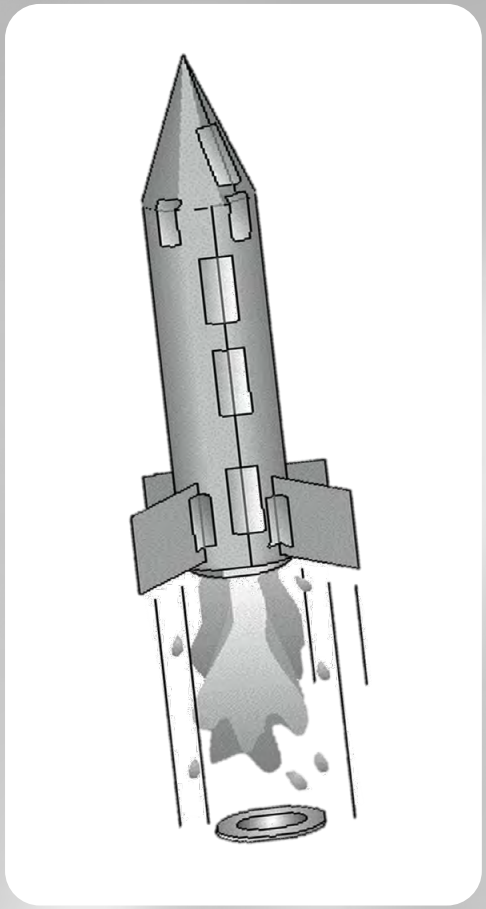
- Sweet tube or empty glue stick container
- Antacid tablet
- Water
- Heavy paper/card
- Sticky tape
- Markers
- Scissors



AF archive / Alamy Stock Photo

THE CHALLENGE

1. Build a small rocket with a sweet tube or empty glue stick container at the centre. The lid should be at the bottom of the tube and easily accessible so that water and an antacid tablet can be added later.
2. You could stabilise the rocket by taping four pencils of the same length to the container to help it stand upright.
3. Take off the cover and put an antacid tablet into the tube. You must be a certain age to get this, so let your teacher provide the tablet for you. You may have to break it into pieces to get it all to fit in.
4. Add a teaspoon of water to the tube, snap on the cover and put the rocket lid down on the ground.
5. Watch what happens once the water dissolves the antacid tablet.



WHAT'S HAPPENING?

By mixing water and antacid, you are creating an acid-based chemical reaction that releases carbon dioxide gas.

The gas fills the tube and the air pressure builds to a point where it is too great to be contained. That's when the lid pops off and the rocket flies up into the air.

EXTENSION

Experiment by adding baking soda and vinegar to the tube.

It may help make the rocket fly higher, faster or even give time for a countdown.

Compare how the different rockets worked. Which one was better?

Substitute soda for water in the antacid rocket and see if it works differently.

YOUTUBE GUIDE

https://www.youtube.com/watch?v=g5DVlJE9MUI

Royal Academy of Engineering

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In collaboration with our Fellows and partners, we're growing talent and developing skills for the future, driving innovation and building global partnerships, and influencing policy and engaging the public.

Together we're working to tackle the greatest challenges of our age.

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