



making physics matter



Age
5-18
years

How to...

Organise a partnership rocket workshop

Introduction

Flying model rockets is a relatively safe and inexpensive way for students to learn the basics of forces and motion. Building and launching a rocket is not only educational, it is fun. Groups of students can work together with a teacher to learn the fundamentals of rocket science. Rocket workshops can be valuable for primary school children, but with some thought they can also be used with Year 12 students to support their understanding of mechanics and the equations of motion, for example.

Case study

Year 9 rocket day run by the Wirral & Chester Partnership

This event was first created in 2015 as a collaborative project for the seven schools in the partnership. The aim was to have an event that was cost effective and encouraged teamwork across the partnership in its planning and running. Having experienced a rocket workshop provided by an external deliverer, the partnership was inspired to develop its own in-house workshop. This has several advantages.

1. It is significantly less expensive.
2. It can be tailor-made to suit your audience. The partnership was keen to put more science into the day to enrich the students' understanding of physics.



3. It can be made suitable for a variety of group sizes.
4. The day can be more varied and feature a variety of rocket techniques (air rockets, water rockets, solid fuel rockets, etc).
5. As a home-grown activity, it helps to share expertise and good practice between the partnership schools.

In this annual event, each partnership school brings 10 Year 9 students for a full day of activities. It is hosted by a different school each year and usually takes place in June or July during the schools' activities week.

Checklist

1. Decide on dates and venue.
2. Host school confirms date with school. This must include the rooms required and outdoor launch space and any requirements from site staff or caretaker.
3. Host school arranges equipment including for solid fuel rockets (if needed).
4. Schools advertise and confirm student numbers (aim for 10 students from each school). Remember to tell students to bring a packed lunch. At the same time ask for photo permission from students in each school.
5. Risk assessments should be completed by host school and emailed to participating schools in advance of the day.



Example rocket day timetable

Introduction – 1 hour session

Students will be introduced to Newton's third law by the teacher and shown an example of the whoosh bottle on wheels*. They then do a balloon race activity to demonstrate their understanding of Newton's third law. This includes finding the centre of mass and making the balloon as aerodynamic as possible. Once they have made their 'rocket' the teams have a race – quickest time wins!

Paper rockets – 1 hour session

Students are introduced to pneumatic propulsion and how this works. The key task for them is to develop a paper rocket that will be able to withstand the pressure and use this force to generate the movement. The students must come up with their own design. Unless you have numerous launchers or only a few students, there is quite a lot of hanging around as each launch takes a few minutes; consider having some additional worksheets or activities that can take place during this time.

Solid fuel rockets (building) – 2 hour session

These rockets end the day and need to be started prior to lunch as there are some aspects of the building where you need the glue to set. If running this activity for the first time, or without any experience of solid fuel rockets, there are many commercial companies that can organise and run this session.

Solid fuel rockets (launch) – 1 hour session

The aim of this session is to show how real rockets are launched and how they can be retrieved when the parachute is deployed properly.

*<http://science.cleapss.org.uk/Resource-Info/SRA006-The-Whoosh-Bottle-Demonstration.aspx>

Health & safety

Model rocketry is fun, but it can also be dangerous. All activities should be trialled by staff and technicians before completing these experiments with your students. Always consult CLEAPSS guidance before completing any practicals.