



WONDERSTRUCK
SCIENCE ON FIRE

St Mary's CBS
Engineers Week Workshops

Tuesday 03rd March 2020

Keep up to date with our scientific shenanigans

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1. About Wonderstruck

Wonderstruck

Since 2004 Wonderstruck has been all about inspiring wonder in the world around us. We work with children and adults in formal and informal settings to explore science in a hands-on, creative and spectacular way.



Nothing we do is off the shelf. You won't find our workshops anywhere else because we make all of our kit in-house. Sure, some of it looks a bit home-made but that's all part of our ethos. We want people to engage with the stuff we do and then go away and think about how they could do it themselves (just the safe stuff, of course!).

The last 15 years has been a wild ride. We've worked in hundreds of schools across the UK with groups from year R to post-16. We've run workshops and shows for 10 children and we've run them for just under a thousand. We've performed shows at the Royal Institution, Cheltenham Science Festival, the Abu Dhabi Science Festival, the Bradford Science Festival and quite a few others.

We've worked with trainee teachers and seasoned professionals to develop demonstration skills (theirs and ours!). In 2015 we were invited to speak to 250 teachers about our work at a conference in Madrid and again in Granada in 2016.

We've learned to do some crazy stuff. We can safely explode a car or a shed on stage (take your pick), take a shower in liquid nitrogen, use a 6-foot long jet engine as a hairdrier and set off 7 kilos of thermite safely on a school playing field.

What does the future hold? We're always learning and we're always developing new ideas so we couldn't really say. But that's the way we like it.

2. Your Day

2.1 Events

Session 1

Workshop: Compressed Air Rockets & Fan-Powered Car Workshop

No. of Students: c.100

Age Group: Secondary

Session 2

Workshop: Compressed Air Rockets & Fan-Powered Car Workshop

No. of Students: c.100 per session

Age Group: Secondary

2.11 Itinerary

0800 – 0900 Arrive & set up. Includes briefing for staff involved in FPC
Workshop

Session 1

0900 – 0920 Introduction to Compressed Air Rocket Workshop in hall

0920 – 0950 Rocket construction in classrooms

0950 – 1015 Rocket Launching on field

1015 – 1030 **Break**

1030 – 1055 Introduction to Fan-Powered Car Workshop in hall

1055 – 1135 Car construction in classrooms

1135 – 1200 Grand Final competition in hall

Session 2

1205 – 1225 Introduction to Compressed Air Rocket Workshop in hall

1225 – 1250 Rocket construction in classrooms

1250 -1310 Rocket launching on field

1315 – 1400 **Lunch**

1400 – 1425 Introduction to Fan-Powered Car Workshop in hall

1425 – 1515 Car construction in classrooms

1515 – 1540 Grand final competition in hall

1540 – 1550 Students tidy up and return kit to hall

Please note that at the end of session 1 the groups involved will need to dismantle and repack their cars. Materials will then need to be returned to the hall as they will be required for session 2.

3. Content

3.1 Compressed Air Rocket Workshop

The Compressed Air Rocket Workshop is highly practical in nature and involves pupils working in pairs to design, build and launch a compressed air rocket.

The topic oriented learning outcomes of the session focus on:

- Forces
- Aerodynamics

The more holistic learning outcomes focus on working in teams, team identity and most specifically the use of teams in providing a diverse skill base.

3.11 Outline of Workshop



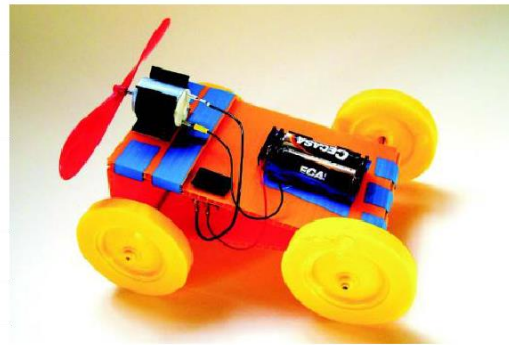
The session starts with a run down of the event and an introduction to the relevant science. This introduction includes demonstrations involving the Wonderstruck Hoverchair and igniting several small, ethanol powered rockets

After the introduction teams are given the main components of their rocket and set to work designing

nose cones and fins. If time allows, teams will be able to test their rocket prior to the final flight. If a competitive element is required teams can be judged on the time aloft or range attained for their rocket.

3.2 Fan-Powered Car Workshop

The fan-powered car workshop is highly practical in nature and involves pupils working in teams of three or four to design and build a small fan-powered racing car (example pictured).



The topic oriented learning outcomes of the session focus on:

- Forces
- The nature and role of friction in machines
- Simple electrical circuits

The more holistic learning outcomes focus on working in teams, team identity and most specifically the use of teams in providing a diverse skill base.

3.21 Outline of Workshop

The workshop starts with an introduction to the relevant science and the process of the workshops.

After the introduction individual classes then return to their own classroom workspaces to start construction of their cars. Each classroom will be provided with selections of different wheels, propellers etc which teams can use in order to try to identify factors which will improve the speed and performance of their car.

Once teams have built and tested their cars each class will hold their own selection competition to decide which car will represent them in the final event held in the school hall (or other suitable venue) at the end of the morning session.

