



Extra-Curricular STEM at Walton Priory Middle School Our Extraordinary Story



With four big National wins, plus a Royal Society grant, the school is celebrating an astonishing STEM prize fund of £22,000 for the 2019/2020 academic year.

This booklet is to show that these successes are just the tip of a pyramid of activity over several years, and to celebrate all those students who have worked so hard – and had so much fun - on their STEM projects, large and small.

OFSTED, February 2020:

“There is a very wide range of clubs and societies. Many pupils participate in these and enjoy doing so. Pupils are encouraged to enter different competitions. **The school has gained notable national success in some of these.**”



The National Enterprise Challenge

NATIONAL KS3 WINNERS 2020



**AIR
PRODUCTS**



Despite the school being partially closed for the **2020** event, team EroSafety (from Year 7) clinched the National Schools' Enterprise title.

Their design of flood and erosion barriers using upcycled gas cylinders from Air Products was “expertly thought out, costed well and presented with style and humour.”

Team leader Olwen Yates was also awarded “Most Enterprising KS3 Girl” for her outstanding leadership of a team that was often working from home.





The Longitude Explorer Prize 2020. National Runners Up

£10,000!



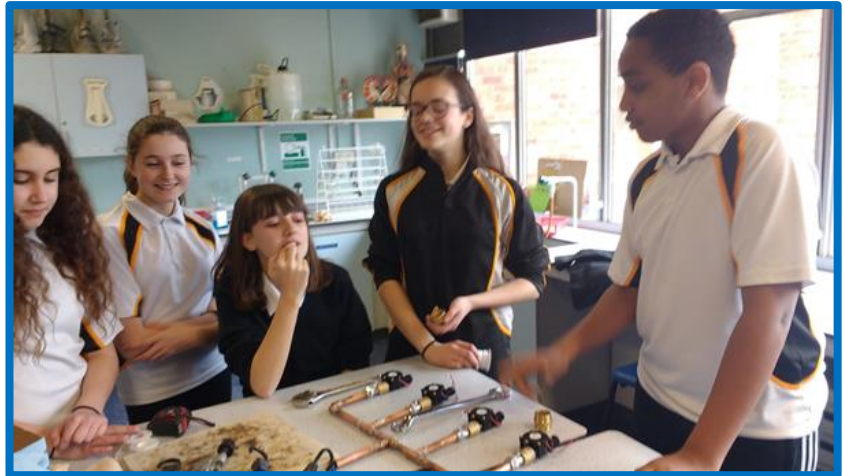
This remarkable Walton Priory Y8 Team, working almost entirely from home during the **2020** lock-down, managed to design a working prototype, complete a 48-page business plan document, and shoot a dazzling video.

Their ambitious solution to the problem of plastic pollution in the oceans involved a fleet of autonomous catamarans and clever use of the ocean currents to take the plastic to shore for efficient upcycling. Using satellite images and innovative coding from GPS signals, the project aimed to identify the areas of most need and use machine learning to navigate their boats into position. Brilliant!

£10,000 is a stunning prize and our biggest to date. The school has used this award to purchase a laser cutter – bringing our technology into the 21st century.



The Shell Bright Ideas Challenge 2018



Set the task of solving the energy problems in a future city, our Y8 group designed and built a “self-contained hydroelectric unit.” A team that was full of character used a home-made pump to lift a tonne of water and subsequently managed to illuminate a single LED bulb.

Their work covered plumbing, hydraulics, the basic gravity and energy equations and fixing dozens of leaks.

After winning the regional award, their impressive performance at a two-day final at the Olympic Park won the team an additional £1,000 for the Collaboration Prize.

These clever young people were great fun to work with.



**National
Finalists
and West
Midlands
Winners
2018**

The Shell Bright Ideas Challenge 2019



Designing a bra that generated electricity as the wearer moved was a bit awkward at times, especially for a team of Y7 girls. However, with the help of female school staff, their project grew into a brilliant demonstration of the laws of physics.

The team's confidence during presentations and Q&A sessions proved to be unbeatable, both at the two-day London Final event and, amazingly, in a school assembly in front of more than 200 boys and girls.

Girls' STEM teams at Walton Priory have proved to be more than a match for the boys at National Level.

**National
Finalists
and West
Midlands
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2019**



The Youth Industrial Strategy Challenge

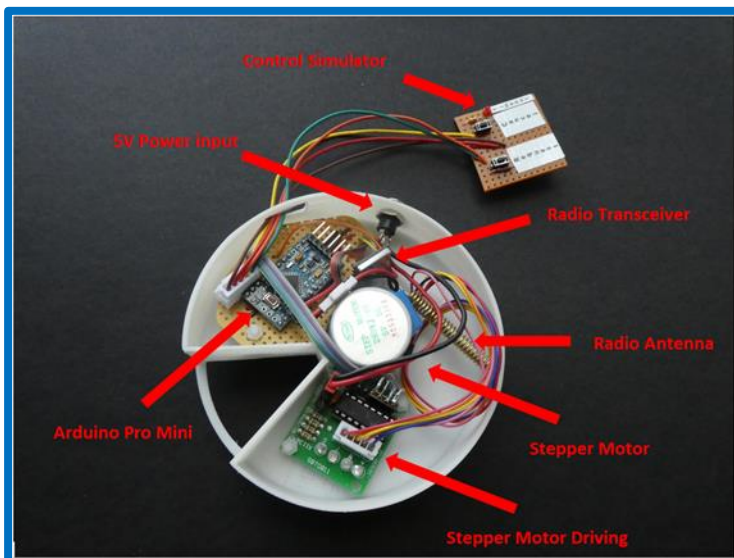
2020 National Finalists



YOUTH INDUSTRIAL STRATEGY COMPETITION

Having won through to the national final at the NEC Big Bang Fair, in **March 2020**, and with fast trains and posh hotels all booked, this prestigious event was cancelled at the last minute due to Covid-19. Our team were so disappointed!

Y7 twins Alice and Lucy, inspired by their elderly Aunt Heather, created a device which helped to manage the medication for people with dementia. Using an Arduino processor and stepping motor in a 3D-printed case... connected wirelessly to a database, the Medicatwins produced a neat and functioning device.



The Big Bang



Faraday Challenge Staffordshire Winners 2020



Our Y8 team won the Staffordshire Heat of the Faraday Challenge at Yarlet in **February 2020**, but their progress to the regional finals, like so many other things, was cancelled.

Teams had to build a working, cost-effective, mobile water purifying machine from a “shopping list” of parts.

The Faraday judge commented that she was most impressed at how the Walton Priory team had shared out the respective tasks and worked so quickly to produce an efficient solution to the problem.

Hopefully, we will have another team up-and-running for this high-profile event in 2021.





The BP Ultimate STEM Challenge National Winners 2018



Against three hundred other schools, a team of Walton Priory girls were finalists and eventual winners in the **2018** BP Ultimate STEM Challenge. They designed and built a waterwheel and managed to produce electricity from a local stream in the depths of winter.

None of their technology was new, but their problem-solving abilities, teamwork and clever presentation obviously impressed the judges.



Struggling with machinery that refused to work, in the middle of nowhere, on a freezing cold day... That seemed to strike a familiar chord with all the professional energy engineers at the presentation!

The BP Ultimate STEM Challenge National Runners Up 2019



Using the expert knowledge of Ryan, a deaf Y7 student, team HIDS (Hearing Impaired Dance Shoes) reached our second prestigious BP USC final at the Science Museum.

With Bluetooth technology and resonance loudspeakers built into shoes, the team demonstrated that deaf people could enjoy dancing as much as everyone else.

Out of an entry of three hundred UK schools, these brilliant and enthusiastic Walton Priory students reached the final three. Who knew that STEM could be so much fun?



The OVO Energy Innovators Challenge.

National Winners. £1,000 Prize



Having reached another corporate-style final event in London, (**September 2019**) our Bescalator team impressed Chris Boardman MBE and the other judges with their design for a solar powered bike lift. The Innovation competition asked schools to invent something new that would help to encourage cycle-commuting.

Beating several teams of older students, the Walton Priory girls proved, once again, that creativity, technological skills, and articulate presentation are a winning combination.

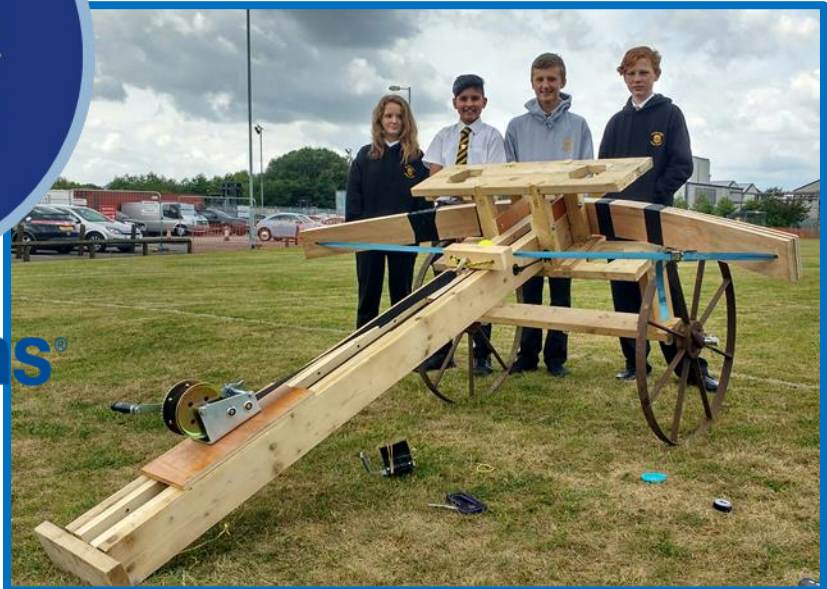
The most memorable part of our day out was probably the struggle to get that huge cardboard cheque home via the rush-hour London underground and two trains.



Stafford Schools Tennis Ball Challenge



Perkins®



Despite building a full-size Roman-style ballista, then converting it to a crossbow, our team was beaten (for distance) by a school with a stick + bungee apparatus. Oh dear.

However, a **£1,500** prize for second AND third place is fine.

Perkins Engines (Stafford) Ltd ran these competitions for a few years but the **June 2018** version was the last. Their apprenticeship programme, however, continues to be of great interest to the school and this important local company always attend our careers days.





Rotary Club Technology Tournament Staffordshire Winners 2019



With their prizes presented by the Stone Mayor: Councillor Mrs Kristan Green, one of our mixed Y7 and Y8 teams won this hard-fought local competition in **March 2019**.

Walton Priory was the host school and welcomed guest teams from Yarlet and Christchurch Academy.

The 2019 Rotary challenge was to build a working crane from a very mixed bag of bits. The rubber-band gearing and a reversible electrical switch made with drawing pins caused all twelve teams some head-scratching, but Walton Priory won through in the end!





The Royal Society Partnership Grant 2020



A Y7 project to “investigate the most efficient shape of paddle on an undershot waterwheel,” has received the financial backing of the Royal Society.

Impressed by the school’s track record in achieving scientifically valid results with children working out of the classroom, the **£3,000** grant has been designed to allow work to begin in **September 2020**. A vacuum former has been purchased to allow children to create and experiment with different shapes.

The STEM Partner for this project is Mr. Joe Barker, of Turbine Surface Technologies Ltd, a Nottingham-based company who work with Rolls Royce jet engines





Year 5 and Year 6



Most of our extra-curricular work is done with Y7 and Y8. This is because companies and sponsors aim their competitions and careers support at students of high school age.

We do, however, take part in KS2 events at the RAF Cosford Museum and at Seighford with our Greenpower go-kart kit.



In January 2020, seventeen teams from Y5 and Y6 entered the BP Ultimate STEM Challenge with their novel ideas for wearable technology. None of those teams reached the final, but we intend to expand our involvement in this competition in 2021 and beyond.



The ERA Foundation

ERA Foundation 2020

Engineering Teacher of the Year

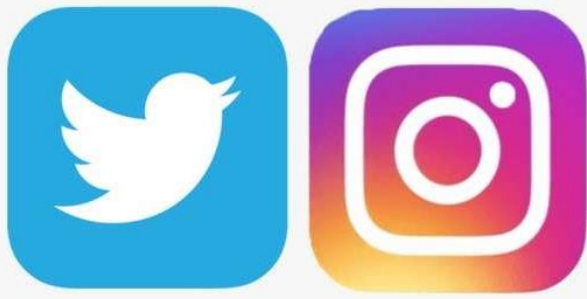


“The ERA is delighted to announce that the **2020** David Clark Prize (Secondary) will go to Gordon Taylor (STEM Technician) from Walton Priory Middle School.

The **£8,000** prize recognises those that have gone beyond what is required in the teaching syllabus and have been able to demonstrate a strong track record of showcasing real-world engineering to students while inspiring them.

Mr Taylor has brought engineering to life at Walton Priory Middle School. His passion and creativity have ensured that young people have been exposed to the very best engineering experiences”





Supporting Teams and Social Media



Nearly all our competition winning, and finalist teams are backed up by four or five additional entries. This demonstrates our strength in depth and ensures that the maximum number of students can be engaged in this amazing learning experience.

Our STEM work features regularly across the school's social media output. You can also find videos showcasing all these STEM teams on the Walton Priory YouTube channel:

Medicatwin, SCHEPU, Bravo, HIDS, Scooterbus, BioBin, Kite Power, Ocean Cleanup, EroSafety, Moo-Thane, PEGS, Waterwheel, HiLo, Braniacs, Tandem Fireworks, Wheelie, SmartPen, SnackSafe, Emotion Spectacles and Tree Power.

The school is lucky to have the support of STEM Ambassadors, both for our STEM work and for careers development. The Ambassadors are volunteers with a wide range of experience in the workplace.

