

## STEM report 2019-20

As part of my brief was to encourage more girls to take part, I began planning and experimenting in Summer term 2019 and over the holidays. I made Bath Bombs, soaps and lip balms, experimented with natural dyes and planned resources and activities. In the summer term I recruited STEM team (staff) members from Maths, Physics and Chemistry and met up to share plans and ask for possible assistance with workshops and trips. I also designed recruitment posters for 6th form Ambassadors, and posted these prior to students arriving in September.



**STEM**  
Student Ambassador Recruitment

**Interviews**  
Thurs 12th Sept 2019 9.30 to 11.00

- STEM steering group
- STEM in lesson support
- Supporting younger students

**About you...**

- You are studying a STEM subject at A level.
- You are interested in finding out more about STEM opportunities locally and nationally.
- You are able to support and guide younger students to achieve creative outcomes in STEM projects.
- You may want to pursue your own independent STEM activity (i.e. in connection with your own (individual) research) with the support of STEM staff.

**Opportunities...**

- Being part of a STEM steering group to help plan visits by Professionals, and make contacts with local/national companies to help with your career development.
- Supporting STEM lessons in class.
- Supporting younger students with project work i.e. Bronze DofE, STEM club.
- Join STEM club to access specialist staff in order to pursue your own project.

ScienceTechnologyEngineeringMaths

In September STEM Ambassador recruitment was promoted by Head of Sixth Form and the response was very good, with 23 students looking to help in some way. Many were interested in helping in class with younger year groups, and I was able to place these students with the help of the staff team. Six students wanted to help out with STEM Club.

The Clubs (one for girls and one for boys) were organised to run concurrently on Weds after school, and I had just put out posters advertising this, when a death in the family meant I had to shelve plans for a few weeks. I relaunched at the beginning of Term 2.

**STEM CLUB**

When is it?  
Wed 3.15-4.15  
D2

**Build and Program**  
Lego Robots, and enter the Robotics competition

**Discover and make**  
Lotions and Potions to make you look and smell better

**Research, plan and make**  
Improvements to the school environment

ScienceTechnologyEngineeringMaths



I had already entered the School for Lego Mindstorms Regional Robotics Competition, and as the first heats were in February there was no time to lose! The boys STEM club built quickly, with a core of 8 students from KS3 who were so keen I found it difficult getting them to leave each week, the girls side built more slowly, and as most were not as interested in Robotics as the boys, they began work on 'Using STEM to improve the School Environment'.

Improving the school environment focused from the start on rubbish under the canopy, and the students brainstormed how it was caused, what measures they could take to rectify matters and so on – their findings were presented via Power Point to the group. At first it seemed they would focus on driving away the cats from the site, but they soon abandoned this to focus on the gulls. Working in pairs, students researched and designed ways to discourage the gulls – two of the Sixth Formers

were looking at developing a reflective gel, most of the KS3 students preferred to redesign the 'Kite scarer'. Using their research (including a broken kite) students created patterns and sourced materials to make new Kite Scarers which we could test and evaluate. They began cutting ripstop nylon, and I ordered the necessary fibreglass poles and fittings – unfortunately these remain unfinished because of COVID.

By January our team for the Robotics Challenge began practising whenever they could after school, and eventually the day arrived to travel to Renishaw in Gloucestershire to participate – we were accompanied by Mr Morris and Kathryn Adlam – a Sixth Form Ambassador. We did well at the speed challenge, and were in high hopes that we would win as we were in first place for a while, but gradually our lead was eroded and we ended up in 4<sup>th</sup> place. The Challenge mat was just that – a challenge, but we did fairly well at completing some of the high scoring parts. The presentations unfortunately showed up a lack of teamwork – an area for development next year! We thoroughly enjoyed the day, despite the disappointment of not winning and learnt a lot about how to improve. The Big Bang Fair had been booked and we were all looking forward to seeing the regional finalists compete there.



I had wanted to reach students in other year groups, and as we were teaching Y9 in 6 week rotations in DT, it was the perfect length of time to run a competition. I selected two of my Y9 groups and they began by taking part in an Energy Quest workshop, learning about different forms of energy, Engineering career options and building eco vehicles to race against each other. Both groups then took part in the Bright Ideas Challenge, completing their entries by February, well in advance of the March deadline. I then collated the forms and submitted them shortly after lockdown. I had thought we would stand a good chance of getting somewhere, but obviously not enough entries had been

submitted in time and the competition was then broadened and opened up to students on a much wider basis so they could complete this individually during lockdown, and the deadline was extended to June. We will wait and see how we got on, but two students, Helena Baxendale and Will Jones - using the work they had begun in the Challenge - independently submitted it for, and gained Silver Crest Awards!



Plans for taking a coachload of STEM Club members, Sixth Form Ambassadors and those who expressed an interest in Y8 to the Big Bang Fair were well under way, when three days before the event it was cancelled because of COVID. There was widespread disappointment amongst students and staff who had been looking forward to the trip, but in June I was able to publicise The Big Bang Fair digital version to students in KS3 via Class Charts.

Plans to enter the 'Scrub up on Science' competition were also put on hold. This competition is run by the Society of Cosmetic Scientists, and would have built on the planned work making Bath Bombs and lip balm (soap making failed the risk assessment). Students would have designed and made a cosmetic preparation using a prescribed list of substances, complete with packaging. The STEM Club girls were looking forward to this immensely – some of the boys were opting to continue with Robot/Lego work, and some to continue working on the School Environment project by identifying, designing and making beneficial animal/insect habitats.

In March a visit was arranged to Mini Oxford in collaboration with The Corsham School. This instructive and enjoyable visit was attended by nine students, my colleague from Corsham, myself and Danny Gant who stepped in as driver at the last minute. Both schools were able to use information on robotics, AI, production systems and JIT manufacturing as a good resource to consolidate a lot of theory for our A level Product Design students.



During lockdown many STEM opportunities arose and I was able to give students access to these via Class Charts. These included;

- Sea Cadets – be an engineer (Sea Scout activities with links to Engineering careers) (all KS3)
- Understanding Biomechanics (activities and design) (Y9)
- Big Bang Online (all KS3)
- STEM Science of fabric dyeing (GCSE Product Design) (activities including making your own dyes)
- Fusion 360 CAD project (Y8 and 9)

I was also able to act as an assessor for a student's Bronze DofE Award, which was based around the use of CAD/CAM to design and 3D print a hovercraft.

All in all a strange year! Many thanks are due to the Sixth Form Ambassadors who supported STEM Club this year – they were so reliable and supportive to the KS3 students, I enjoyed working with them and with all the Club members. I feel like we moved forward in the recruitment of girls and the widening of the STEM brief, and I am sad to step down from the post in many ways. It is good to know that the STEM co-ordinator role is now to be filled by Mr Morris, who accompanied us on the Robotics trip, and who now has a good grasp of what's involved in that particular competition - I wish him the best of luck for 2020/1.

Anne Ainsworth (STEM co-ordinator 2019/20)

July 2020