



October Diary Entry

The aim of our project is to inspire students of all ages with new and emerging technologies. Within the new Design and Technology curriculum, we are already teaching many exciting and innovative project ideas – but we wanted to introduce this earlier for our students, and encourage them to reason in a more creative and forward-thinking manner – and work towards those “jobs of the future”.

Our method of channelling this is by implementing a 3D Printing club and aspirational competition open to all students – our first few weeks of putting our plan into action have been inspiring for us, and have also shown us just how much our students have already bought into the exciting opportunities we have available to them. The Design and Technology department have been truly motivated thus far to bring our vision to life, and it has had a flying start as a result of this.

We have also added a new member to our team – James Windle is a Teacher of Science, who brings passion and enthusiasm to the project. His method of teaching is purely inspirational, and he often adds a wider context to his lessons. James will be a fantastic team member, as we not only wish to bring the Design and Technology aspects of 3D Printing to life for our students, but also introduce this to the Science schemes of work and scientific approaches to the new and emerging technologies as well.

Lorna Dee Evans (Team Leader)

During the first few weeks of implementing our Action Plan, the first step was to raise awareness. Not many students knew about the fact we have 3D printers in school, and we knew we had to get the word out to bring a sense of “occasion” to the extra-curricular club. As a teacher of Design and Technology, I planned a single lesson, which would slot into each rotation area for all Key Stage 3 classes. This was delivered with great enthusiasm by the team; Andrew Mangham, Helen Dunn, Sarah Trowers and myself. The students had a great enthusiasm for the lesson – learning about how 3D printing can be used in the world of medicine, architecture, product design, and even revolutionary areas such as prosthetics and military. The aim of the lesson was to get a feel for how many students would be interested in signing up for an extra-curricular club – and the interest was huge. We had over 70 students put their names down on the initial sign-up sheets and asked them to come to a meeting to find out further information.

The club runs on Thursday afternoons from 3:00-4:30pm – due to clashes with other extra-curricular events, we now have numbers of approximately 30 students attending each week. Due to the extra numbers (our expectations were that we would have around 20!) we have liaised with the Computer Science department and now have access to two computer suites to use for our club – meaning we have access to 60 computers, should we need them. One thing I have found to be really lovely is that we have members of Y7, Y8 and Y9 all attending the club – which lends itself beautifully to a “linear learning” approach – when you see a Y7 student helping their older peers with something they have learned – it is truly marvellous to watch.

The first few weeks of the club have run smoothly, with all students gaining access to TinkerCAD and beginning to learn how the software works – creating their own designs and tweaking from existing online ones. As the skills of the students are progressing, we are setting mini briefs for them to complete during their time – the best ones get 3D printed for the following week; this is acting as a fantastic motivator in terms of attendance – as every student wants their design to be the one chosen!

At our Y6 Open Evening event, we had a showcase of 3D printing – making use of eight students who attend the club. The response we had from prospective students and parents was phenomenal. All who visited on the evening were excited to see the 3D printers in action and even try out our 3D printing pens. I borrowed laptops from around the school, and my KS3 students spent the evening making their own models (to the delight of the Y6 students who could help by adding a component here or there!) It was fantastic for my club attendees to be the ones talking through the 3D printing process to the parents and Y6 students – because it was thrilling to see how much they have learned in such a short space of time – and seeing them grow with confidence over the course of the evening (especially our SEN learners/those who are normally a bit quiet in class) was a testament to the impact the extra-curricular club has already had.

This month, we have also set the Contextual Briefs for the competition; these have been set each by a team member who will become an “Expert” in their chosen field. There are five briefs: Textiles (me and Sarah Osgerby), Product Design (Helen), Food (Sarah Trowers and Sarah Osgerby), Engineering (Andrew) and Science (James). The competition will be launched on 14th November 2019 – by which point the students’ TinkerCAD skills should be able to handle the challenge! Going forward, my next steps are to speak to local businesses who work with 3D printing/young designers to see who will support the work of the project alongside our school and team. Our Rolls-Royce mentor, Neil Chattle, has also agreed to be a judge for the competition.

Helen Dunn

Since the exciting news of becoming finalists for our 3D printing proposal both the department and students have excitedly embraced the first weeks of the new academic term. 3D printing club has started strongly with a large number of students getting to grips with TinkerCAD and how their imagination can run wild; leading to future 3D prints. All KS3 students were taught a single theory lesson on 3D printing which introduced our Rolls-Royce brief but also served as vital theory as part of our backwards planning from the GCSE specifications. Students were amazed by the possibilities of this technology and eagerly asked plenty of questions.

Personally, I have integrated 3D printing into my Y7 Scheme of Work this year to teach students more CAD/CAM and their prior knowledge from the introduction lesson has helped hugely. Those attending the club have shown strong leadership skills to help others in their own work. It is not just the practical and programming side students are learning, but more about the technology itself and how it is continuing to help solve problems (great and small). Knowledge is then demonstrated in exam style questioning as part of our End of Rotation assessments.

As the D&T GCSE and A Level specialist I have written a competition brief which reflects the problem solving the NEA requests and I am excited to see what iterative designs students produce!

Andrew Mangham

The pupils were all shown the 3D printing presentation and I was amazed at the overwhelming response from the pupils. All were eager to ask questions about its potential and thought of many things which hadn’t occurred to me. I think it will blow their minds to see the printers up and running. Especially as we have three of them. It will be fantastic to see the pupils using these to make objects of their own design; in fact, I am wondering if we could print custom-made parts for our Vex IQ robots, things that do not exist anywhere else.

It has been really surprising to hear pupils talking about the printers in the corridors as they walked to lessons, they have really created a buzz and I aim to start talking about them to Y8 so they can think about adding 3D printed parts to their vehicle designs, for example axle stops and spacers. This will further integrate the new and emerging technologies into the KS3 Engineering schemes of work. I think that these printers could be used to make plastic bottles reusable by making small components that allow this to happen. I have conducted some of my own research and seen connectors on the internet that turn the bottles into rigid structures such as chairs and tables. Wonder if we can turn bottles into propagators and give them a new life, may be make spikes and vents that could do this. I aim to set something along these lines as my competition context.

Sarah Trowers

Being a part of the team is something I am really excited about and as the Head of KS3 D&T it is something which has expanded my own knowledge and skillsets when it comes to 3D printing. Seeing the Y6 students' excitement about the exhibition at the Open Evening was fantastic and really made an impact. I had a lot of parents coming to speak to me on the evening to say how brilliant it was to see such advanced technologies in a school environment, and they were genuinely excited that their children would be learning how to use such technology.

I have worked with several students so far at the Thursday afternoon club, and we have started discussions about how 3D printing can be used in a kitchen environment – not only 3D printing food (which they all desperately want to do...) but also about how the manufacturing skills could make our kitchen aid products more comfortable, or more eco-friendly. It has been fantastic to build these links with students who sometimes just see me as “the Food Tech teacher!”

Sarah Osgerby

At the start of this month, I was given time to concentrate on getting all three 3D printers up and running. I needed this time as going to try and tweak the printers, which I had built from kits, for a grabbed moment here and there was not getting me any further forward. To have the luxury of nearly a full day of ‘tinkering’ was wonderful. By the end of the day I had got two working perfectly and one, printing okay but still needed a little bit of my time. I also had time to put up a new display on the corridor of uses of 3D printing in medicine, food, buildings, furniture etc. There are gaps where I can attach printed examples in the future, once we get them printed! Or even student examples from the extra-curricular club?

The printers were installed in IKEA cabinets in GA6, with hasps and padlocks fitted to avoid damage when not in use. A multipoint fitted on the wall, and a timer switch purchased to turn off the printers if a print goes over end of working day. This will mean that the machines can run all day – allowing us much more printing time than ever before. Classes held in the room were slightly distracted by the machines printing, but both students and staff were excited to see them in action. Our deputy head teacher is considering purchasing a 3D printer kit himself to build and use with his daughter, inspired by the machines.

James Windle

I am delighted to be welcomed to the Rolls-Royce team. I am excited at the possibility of engaging students in science in a brand new way using 3D printing technology. I have many ideas buzzing around my head regarding where we could use this in the science faculty. If we are able to get student to create models of the human anatomy, it will solidify their knowledge and create a deeper understanding of how complex the human form is. In addition to this students could print and test their own designs to test for forces/aerodynamics and see first-hand the difficulties designers face.

Mentor Update: Neil Chattle

It was a pleasure to be introduced to our project mentor; Neil Chattle. We have spoken on the phone about the overall project and how the Rolls-Royce support works. We have also agreed that when the competition is up and running, that he will be one of the judges in the competition! Our team and our students are looking forward to working with Neil – the experience he has to offer us will be invaluable and we are truly looking forward to welcoming him into the school.

Images

The top image shows the 3D printers now in situ, the purchase of the IKEA cabinets has meant that they are safely boxed away and cannot be fiddled with during lessons - meaning that printing can happen all day!

The bottom image shows two Y7 students working on their TinkerCAD designs in their Design and Technology lessons. They are using the how-to guide created by Helen to make their 3D images come to life.



Expenses Update

Total awarded: £6,000

Date	Purchases	Cost
16/05/2019	Filament and 3D printing pen	£107.98
20/05/2019	Magigoo, silica gel sachets and 3x storage boxes	£64.99
06/06/2019	SD cards	£10.64
11/09/2019	IKEA cabinets, doors and hinges	£153.97
24/09/2019	Padlocks and hasps	£21.12
30/09/2019	Multi-plug	£5.30
Total expenditure:		£364.00
Remaining Balance		£5,636.00