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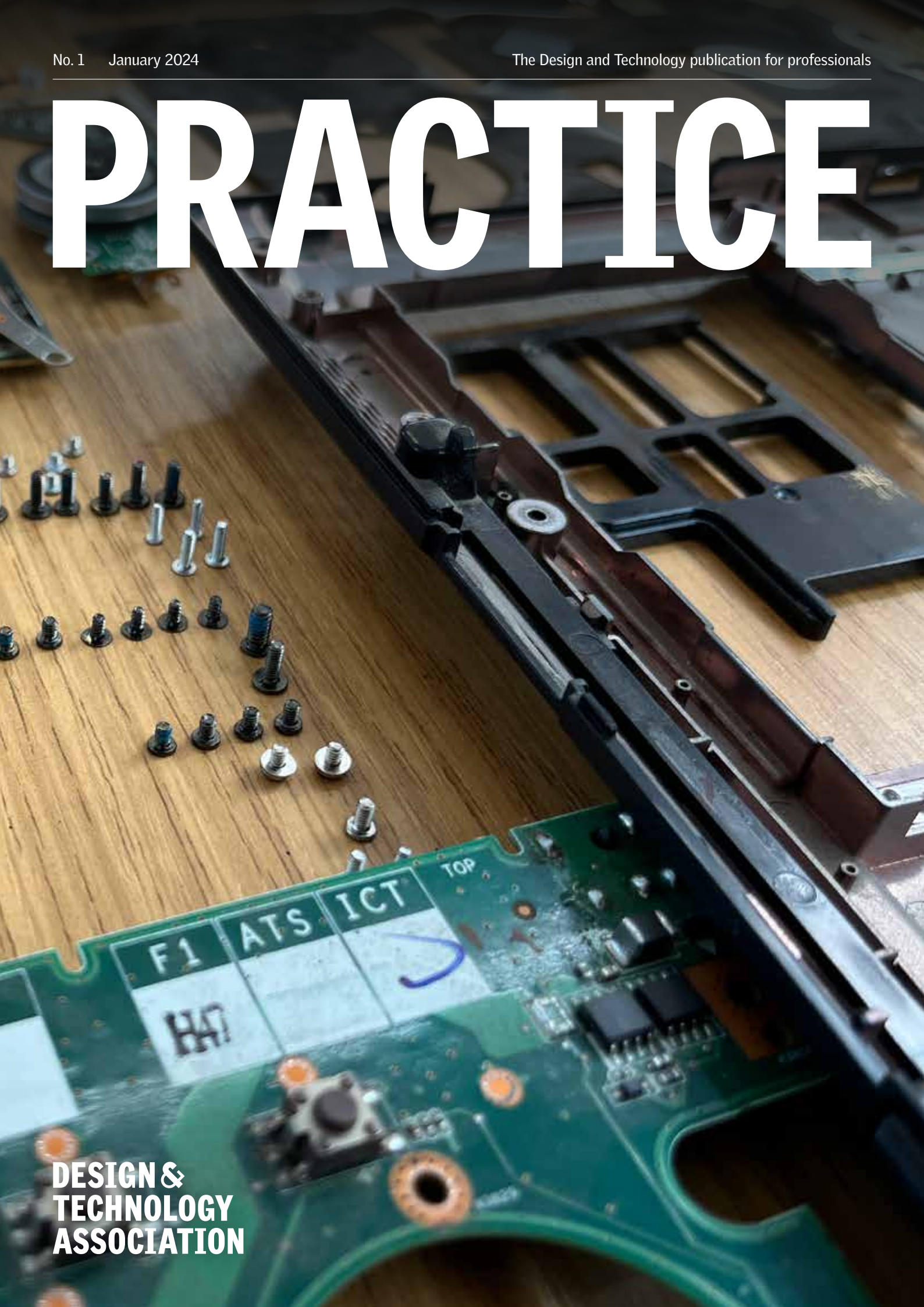
The Design and Technology publication for professionals

PRACTICE



DESIGN & TECHNOLOGY ASSOCIATION

DESIGN & TECHNOLOGY ASSOCIATION

What's coming up...

Nominations for the Design and Technology Excellence Awards 2024 are officially open! To find out how to nominate please contact **neesha.mistry@designtechnology.org.uk.** The deadline to nominate is the **10th of June.**

We will be continuting to add further contexts to our Inspired by Industry resources. These are free to access and we are also developing further free member-only content.
Visit: **www.inspiredbyindustry.org.uk**

We are continuing our exciting loan scheme from our Blueprint 1000® member CREATE Education providing 3D Printers to Primary Schools. To find out more please contact: **amelia.wright@designtechnology.org.uk**

We have scheduled face-to-face and online courses to cover mutiple areas of Design and Technology for both Primary and Secondary teaching. Visit: **www.designtechnology.org.uk/training-and-events/**

We are offering free webinars covering a range of topics including an introduction to Vex GO, the Seymour Powell Innovation Competition and more. Visit: **www.designtechnology.org.uk/training-and-events/ and select 'Webinars' from the drop down menu.**

We will continue to have exciting guests on our 'Designed for Life' Podcast which is ideal for designers, students and educators. Visit: **www.designtechnology.org.uk/for-education/media-video-and-podcasts/podcasts/**

More exciting schemes, Teachers in Residence programmes, LIVE Podcasts and more coming up so keep your eyes peeled!

Because design and innovation matter

D&T Practice magazine
This publication is intended to update members on what is happening in design and technology and related areas of the curriculum. We welcome contributions highlighting the practical aspects of design and technology teaching, including case studies of good practice and resources used. Articles are approximately 800 to 1,000 words in length and accompanied by pictures illustrating the process described.

Outline summaries or completed articles should be accompanied by images to be included and sent in the first instance to the Editor, Laura Martin: laura.martin@designtechnology.org.uk.

Articles which are attributed to an author do not necessarily represent the D&T Association's views nor do advertisements indicate the D&T Association's endorsement of the products featured. Articles in D&T Practice are published in good faith and whilst every care is taken in compiling this publication the publisher cannot accept responsibility for inaccuracies or changes after publication, or for consequential loss arising from information in articles.

Letters in connection with D&T Practice should be addressed to the Editor. The contents may not be reproduced without the permission of the Editor.

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Copy deadlines 2024
Members and subscribers wishing to contribute to D&T Practice should provide completed articles and accompanying materials by the following dates.
- Practice 2.24 – Editorial: 12th Feb for April Release
- Practice 3.24 – Editorial: 8th July for September Release

Due to the range of topics covered and quantity of materials received we cannot guarantee publication and articles may be delayed for an appropriate issue. Contact laura.martin@designtechnology.org.uk for more information.

Visit us for more resources, news and information: designtechnology.org.uk

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D&T Practice is printed on paper derived from renewable sources and wrapped for distribution in fully composable materials. It is available as a downloadable pdf version through the D&T Association's website **www.designtechnology.org.uk**

Advancing Design & Technology Education

As schools across the country enter the 'business stage' with years eleven and thirteen, I thought this might be an opportune time to update you on our lobbying activities and progress. I am very aware that this critical work can fly very much under the radar of most.

I should start by stating that the term 'lobbying' covers a broad church of work. When I use this term, my definition would be *'work that brings us closer to key decision makers in our efforts to inform the decision-making process and gain a set of desired outcomes'*. I regard this as one of the Association's main functions and is, at least in part, what members pay their yearly fee for. I estimate that in some form or other, this now constitutes at least 50% of my time.

Let's start with what we hope to achieve from this lobbying activity. This may sound like a daft question, but without a very clear and considered response to this question, we will never achieve success.

The decline of our subject over the last twenty years has been dramatic, from 430,000 GCSE entries and 26,000 A Level to 78,000 and just over 10,000. A trained teaching workforce of a fraction under 15,000 in 2009, down to a little over 6,000 now, being just two statistics that can only be described as shocking and negligent by those holding power.

I have heard it said by some throughout 2023 that the subject is in such a state of decline that it cannot continue and is destined to drop off the English National Curriculum. I purposely state 'English' here, as with power devolved for education to both Wales and Northern Ireland, we have less influence over curricula in Wales and NI. I do not 'buy into' this statement; in my opinion, the subject is wounded but is not dead...there is no doubt we need reform to gain traction and growth, but I subscribe to a model of evolution, not revolution.

As outlined in our vision document 'Reimagining Design and Technology', we are subscribing to a model that builds from the bottom up. Primary D&T is thriving and growing, and one of our main objectives as a professional Association is to support and nurture this growth. We will finish 2023 with just a fraction under a fifth of all primary schools nationally now members. We expect this to continue to grow across 2024 and are investing heavily in resources to support this growth.

Our recently launched 'Inspired by Industry' work is aimed at helping teachers and subject leaders further enhance their KS3 offer. These learning units take real problems from industry and present these through video and related support materials so that schools can insert these into their KS3 curriculum. Each unit of work is carefully mapped to the National Curriculum. We will introduce free online webinars starting early next year to assist department leaders and teachers in successfully planning how to introduce this work into existing curricula.

The' Inspired by Industry' work has been a joy to build, and we now have a long list of companies keen to collaborate with us on future projects. This is not a 'flash in the pan' but is instead the start of a sustained period of work within which we will build and grow these resources. Our objective is to build pedagogy slowly and sustainably in KS3 that concentrates on process and problem-solving alongside outcomes. All these materials are free at source, with enough resources available without charge for these to be delivered in all schools. Association members will have access to additional support materials to help them further build this work.

As we build KS3 with 'Inspired by Industry' we are also looking to curriculum reform and KS4. Our research with teachers demonstrates that change is required, especially at GCSE, where the curriculum content is simply too heavy to cover effectively. We will be working closely with all awarding organisations and with the DfE and Ofqual as we seek to prepare a revised offer for curriculum reform, currently planned by government to start in 2025.

Finally, we move to A Level. We have research to carry out here as our members tell us the A Level is generally fit for purpose. Yet, anecdote from individual universities suggests that a pass in D&T is perhaps valued less by university course leaders than for example in Art & Design and even Psychology. We cannot build on anecdotes but instead need to conduct research to determine facts we can then confidently build upon.

So, what changes are we pushing for now with our lobbying efforts?

- At primary, we want to build on a research project started two years ago with Create Education. This initial research suggests primary teachers and their students can successfully introduce CAD and 3D printing to their curricula. We want to run a larger research project involving 100 schools with a view to this becoming a national initiative.
- There is no mention of circularity, sustainability, or the need for a green economy within the primary National Curriculum. We believe our subject provides the perfect base to cover these important topics, and we are working to introduce this alongside lobbying for change in this area.
- We are working closely with the IET and others to bring business and industry closer to the primary D&T curriculum. Whilst we do not intend to turn primary D&T into 'engineering', young people need to understand what an engineer is and does. They need to understand what attributes an engineer needs to grow and nurture, including problem-solving, curiosity, teamwork, tenacity, the ability to research for themselves and how to turn ideas into prototypes.
- We lobbied hard to increase the D&T ITT Bursary. This was dropped entirely just a couple of years ago, causing a devastating drop in recruitment. The recent announcement by the government that this will rise to £25K from September 2024 is excellent news, but we still lag behind maths, physics, chemistry, and computer science...our work here is not finished.
- We are pushing hard for a dedicated initiative to encourage designers and engineers currently working in industry to convert to teaching D&T, similar to the recently introduced 'Engineers Teach Physics' programme, which is starting to gain traction.
- At KS3, we will continue to build our 'Inspired by Industry' initiative and will introduce a focused research project to independently assess the impact of this work on teacher confidence, student engagement and student progress alongside any changes in gender uptake that this may promote.
- At KS4, we will work with all awarding organisations to determine what assessment and syllabus changes are required to enable schools to push forward positively with design and technology education. We will be ready when the government starts its curriculum reform programme in 2025.
- At A Level, we will carry out a focused research programme to determine the value of the D&T A Level to relevant courses, including product design, industrial design, sustainable design, textile design and others. Again, we are preparing ourselves for upcoming curriculum reform.
- We are lobbying for every school nationally to be allocated protected funding to support teacher subject professional development in our subject. This recognises that content in our subject changes at speed, and we have a large number of non-specialists teaching this subject who urgently need this support.

I hope you can see from the above we have a plan, and we are working tirelessly on your behalf to ensure that D&T (or whatever a 'new' revised subject might be called) takes a central place on the school curriculum offer for all students, not just those with social advantage. The work continues.

If any of the above raises questions, please do not hesitate to contact me; we are here to serve our members' needs, and we are listening.

Tony Ryan
Chief Executive Officer

inspiredbyindustry.org.uk

Response to House of Lords Report

D&T Awards 2023

Keynote Speaker
Ben Edmonds

In a captivating talk at the recent Design and Technology Association Excellence Awards, the spotlight shone on Ben Edmonds - a designer, inventor, entrepreneur, and seasoned 'tinkerer.' Ben's journey unfolds as a compelling narrative, tracing back to his ambitious declaration at the tender age of twelve: "I want to be a lead designer for Dyson." Two decades later, he realised that childhood dream, achieving the prestigious role of Principal Designer at Dyson.

Ben's story transcends professional achievements. A true adventurer, he has twice parted with almost all his possessions to embrace new beginnings across the globe, departing from a job not once, but an astonishing four times. His talk was inspirational and captivated guests at the ceremony.

As well as being our keynote speaker at the awards, Ben also joined us as a guest on our well listened to podcast 'Designed for Life'. In this episode Ben reflects on his life's journey, offering a glimpse into his multifaceted career and the motivation driving his innovative pursuits. The episode provides a rare opportunity to delve into the mind of a creative powerhouse, exploring the twists and turns that have shaped Ben's extraordinary life.

Accompanying the podcast is Ben's profound statement, emphasising his dedication to fostering creativity and problem-solving skills among students. Through his initiative, Inventor Club, Ben aims to shift the focus from mere instruction-following to empowering children to tackle and solve real-world problems. The club encourages a mindset where failure is not a setback but a stepping stone toward innovative solutions.

Ben's mission aligns with the vision of the Design & Technology Association, which strives to promote quality design and technology education.

To stay updated on Ben's endeavours and the Inventor Club, visit www.innovationben.com and www.inventorclub.co.uk.

Stay tuned for upcoming episodes and explore the entire Designed for Life series which is sponsored by the Edge Foundation.

A Huge Shoutout to Our Event Sponsors:

We owe a massive thank you to our generous sponsors, who made the Design and Technology Association Excellence Awards possible: Autodesk, The James Dyson Foundation, Nook Pods, The Institution of Engineering and Technology, Co2 Laser Repairs, HPC Laser, Leo Lion Ltd, The Royal Academy of Engineering, WJEC CBAC, and The Engineering and Technology Education Research Center. Special recognition goes to The James Dyson Foundation for sponsoring all the tables and PTC Onshape for keeping our glasses filled at the drinks reception.

Links

Designed for Life with Ben Edmonds: www.designtechnology.org.uk/for-education/media-video-and-podcasts/podcasts/in-conversation-with-ben-edmonds/

Design and Technology Excellence Awards: www.designtechnology.org.uk/news/dt-excellence-awards-2023/

Products for New Mothers Inspired by Elvie

In the realm of Design and Technology education, the exploration of real-world problems serves as a powerful catalyst for innovation. This is one of nine, free contexts released by the Design & Technology Association to bridge the gap between education and industry. Further contexts will be released throughout 2024.

This particular context was devised with the help of FemTech company Elvie and it opens a gateway for students to delve into the nuanced needs of new mothers and craft inventive solutions to ease their journey into motherhood.

Elvie

Elvie was founded by Tania Boler, an internationally recognised women's health expert. The company have spent over 10 years developing cutting-edge technology and breaking societal taboos in order to level up women's lives. From introducing the world's first silent, wearable breast pump to developing pelvic floor exercise trackers, elvie has consistently pushed the boundaries of what is possible in the realm of women's health technology. Beyond their technological feats, the company champions a holistic approach that reflects a deep understanding of the daily challenges faced by women.

Unleashing Creativity through Materials

This design context encourages students to experiment with different materials, providing a dynamic platform for creative expression. From fabric innovations for baby-changing accessories to incorporating electronics using micro:bit or Crumble, the scope is as broad as the challenges new mothers encounter. Harnessing the capabilities of these technologies, students can prototype solutions that react to external changes.

The Design Journey

The design cycle serves as a navigational guide for students, ensuring a thoughtful and iterative process. The stages, from empathizing with the challenges new mothers face to ideation, prototyping, and testing, create a holistic approach to problem-solving.

Investigative and Evaluative Activities

There is plenty of scope for researching this context which includes:

Shopping Around: Explore baby shops to understand existing products for newborns and expectant mothers.

Plastics and Moulding Processes: Investigate plastic processes, both in the classroom and industry, considering their suitability for new mother products.

Smart Materials: Delve into smart materials, such as thermochromic pigments, and contemplate their benefits for new parents.

User Profiling: Conduct observations, interviews, surveys, and secondary research to create detailed profiles of new mothers, guiding design priorities.

Empathy

In the journey of crafting solutions for new mothers, this curriculum not only nurtures design thinking but also instils a sense of empathy and innovation in the designers of tomorrow. As students embark on this inspired design expedition, they contribute to a brighter, more supportive world for new mothers.

Links

Elvie: https://rb.gy/m9pq3d

Inspired by Industry: inspiredbyindustry.org.uk

Contextual Challenge

By encouraging students to tackle real-world problems during KS3, the initiative seeks to inspire and engage them while laying the groundwork for future success in non-examined assessments at KS4 and beyond, using methodologies employed by industry professionals.

Learning from industry approaches can help shape the future of D&T education by equipping students with the skills and knowledge required to thrive in industry.

This innovative challenge is available for all educators for free. Association members gain exclusive access to additional materials, further enhancing the learning experience. You can find more details on this and other recently released contexts via: www.inspiredbyindustry.org.uk

Why is it important that elvie support D&T in the national curriculum?

Growing up, I wasn't sure what I wanted to do as a career. One of the reasons for this was a lack of opportunity to understand what was involved with different roles.

Our mission at elvie is to create products that empower women, enabling them to make choices about how they live their lives. We are fearless innovators who break product development conventions and taboos every day - creating products for under-served women's health needs that have been long-neglected.

By supporting D&T in the national curriculum, we hope to inspire the next generation of innovators, preparing all young people for the D&T or STEM careers of their choice in the future.

Sarah Liddell,
Chief Product Officer (CPO) at elvie.

D&T Bursary Raised for 2024

Department for Education

Many will have seen the extensive lobbying work which has been undertaken at the Association in response to the Education Policy Institute (EPI) Paper 'A spotlight on D&T education in England'. This paper collected secondary research and presented a dire picture of the subject's current position nationally.

The Vision Paper, entitled 'Reimagining D&T,' was drawn up in response following a series of face-to-face and online teacher consultations across the UK. Teacher feedback helped to outline key proposals, recommendations and calls to action from the Department for Education.

One of the key proposals from our consultations was for the Initial Teacher Training (ITT) bursary to match other STEM subjects, establishing incentives for industry professionals to transition into teaching design and technology.

This was further called for at a recent appearance before the Commons Education Select Committee on the 12th of September where our Director of Education, Ryan Ball presented the enduring struggles of design and technology (D&T) teachers to MPs. The committee, as part of its ongoing inquiry into teacher recruitment and retention, received crucial insights into the challenges faced by D&T educators. Ryan outlined a number of issues including the increase of non-specialists teaching D&T due to staffing shortages.

One key aspect raised was to see the bursary for D&T be increased to keep in line with other subjects as D&T currently grapples with recruitment difficulties (See video).

Bursary raised

We were pleased to see the Department for Education announce that existing bursaries for design and technology will be raised to £25,000 for 2024-2025. This supersedes the recent rise in 2023 to £20,0000 from an initial figure of £15,000 and complete removal of the bursary just a few years ago. You can see the full announcement from the DfE here

This is a great result and a definite step in the right direction.

Our CEO Tony Ryan comments, "*I am delighted to see this increase in the bursary figure available for D&T trainees from 2024. Statistics suggest that this bursary figure matters and should lead to increased numbers of trainees next year. Whist the Association is not claiming that the Government has acted as a result of our lobbying, but we like to think that we have at least helped to influence thinking, which, of course, is one of the key roles of any professional Association.*"

Still a long way to go

Whilst this is a positive move forward, there are still a number of hurdles to tackle to ensure the preservation and growth of the subject.

There was significant discussion at the Education Committee into the need for reevaluating the perception of D&T as a subject. Ryan expressed concern over the legacy view of D&T, support with class sizes and financial investments for budgets and teacher CPD to ensure the delivery of the subject. These investments are crucial for procuring the materials, equipment, and technology necessary for delivering a robust curriculum.

Links

Education Committee - Tuesday 12 September 2023 - https://shorturl.at/fwSWZ

DfE announces £196m to recruit more teachers – www.tes.com/magazine/news/general/dfe-announces-extra-funding-recruit-teachers?amp

Why is Lobbying Essential? - www.designtechnology.org.uk/campaigns/why-is-lobbying-essential

Post-graduate ITT recruitment for Design and Technology has been below the target the Department for Education has set since 2015/16 and substantially below 50 per cent most years.

Bursary raised

A journey through design and technology

Gautham Ravisankar, Altrincham Grammar School for Boys

From the moment I stepped out of the womb, I could see my life laid out before me. Triple science GCSE; Maths, Further Maths, Physics, Chemistry A level; followed by a respectable Engineering degree and a comfortable, well-paid office job. And my parents loved it! I took the exact steps charted for me, and each stage of my life slotted into place perfectly. Until a second option materialised: a turn that could change the course of my life. Design and Technology GCSE.

Options evening

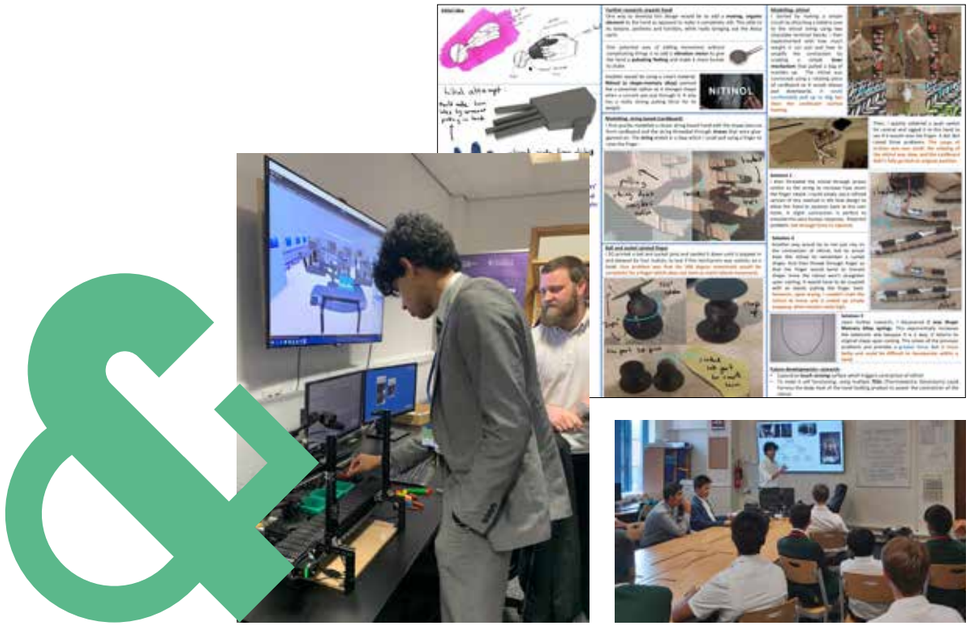
Options evening was a time of chaos; my parents' foreheads furrowed, dubious about the concept of coursework and worried by the apparent lack of academia. But I couldn't help it. I'd felt a spark that I couldn't ignore. I closed my eyes and took a leap of faith.

Classroom and workshop

When you open the door to my GCSE classroom, you are greeted with a set of tables, stations of creativity, design and penmanship, where the ideas blossoming in students' heads are painted onto a canvas. This is where I was taught the skills to do that: isometric sketching to give form and 3D shape, rendering to give colour and life, third angle orthographic to please the manufacturer hungry for technical details. Here you'll find some of the few computers in the school with dedicated graphics cards. A medium for us to take our ideas from a 2D page and breathe life into it in a virtual three-dimensional space - Fusion 360, Blender and Sketchup, all optimised for development, digital simulation and photorealistic captures.

But digital workspaces only get us so far. The workshop, an abundance of cardboard and Styrofoam, allowed our jittery fingers to begin crafting in real space. Ideas were tangible here, as we developed precise hand skills, used saws, files, chisels and basic machinery – pillar drills and scroll saws – the essentials for a school D&T room. To step up from models to functioning prototypes, a whole new set of machines were available – vacuum formers, routers, lathes. That was simply the tip of the iceberg. Hidden away in another room was a whole other world. Beasts of machinery that pushed students to experience raw mechanical power first hand and a whole host of CNC machines gave us a flavour of automated manufacturing.

A loop around our classroom is actually one cycle of the renowned iterative design process, repeating through research, design, modelling and evaluation to optimise product development. I was gifted the opportunity to experience engineering in its rawest forms, but it was more than that. It was a workshop of polymers, hardwoods, softwoods, but also a workshop of emotions, self-discovery, and dreams.



GCSE

I entered GCSE striving for perfection, with a pathological need to succeed, trapped by a fear of failure. D&T forced me to fail. My 'perfectly' designed GCSE product – rearrangeable magnetic modular storage units for bicycles focusing on phone navigation and security – was heavily reliant on 3D printing, but was met with repeated failures, and hours of filing and chiselling to correct those imperfections. After multiple iterations I realised that there was no such thing as perfection in the real world. The purpose and fulfilment I feel in my life I credit to my GCSE teacher, Mr. Williams, who pushed me to the limits to show me what is possible, if I had the discipline to achieve it.

GCSE D&T also changed my perspective: it was a test of not just the conception of a thought, but the transmission of that thought to someone who thinks and understands the world differently. The requirement to present designs to clients, to step out of my comfort zone, to investigate in the real world, all proved that knowledge is only as good as the ability to communicate it.

A-level

I now had full reign over what to work on and what style to develop. I chose to go into the most exciting field I've ever looked at: a fusion of haptics and music. My A-level coursework aims to allow a user to 'feel' music in their body and replicate a concert experience in their bedroom.

When experimenting in such an advancing field, the teachers pushed me to think outside the classroom and scout new possibilities. One treasure we stumbled across was a trip to the Virtual Engineering Centre at Daresbury Labs, which catapulted us into the forefront of innovation and technology. We learnt about digital replicas of real-life environments for simulations, gaped at a digital scan of a whole city projected onto a screen, witnessed robots doing what no child could ever manage and perfectly sorting out Lego bricks by colour, and much more. Most importantly, we got to interact with the nicest group of engineers working in what seemed like a dream job.

D&T has also built up a skillset that allowed us to seamlessly integrate with super-curricular engineering, whether this be prestigious competitions or side projects simply for passion. I've entered multiple design contests, managing to obtain many successes (and a few heart-breaking failures), getting a Teen Tech Final invitation simply for my GCSE project.

The future

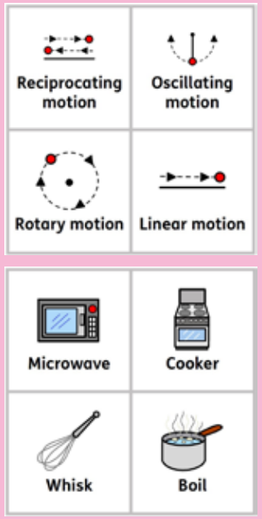
So, fifteen years down the line, do I still see myself in an office? Yes. But this time, an exciting adventure that begins on a table, and then carries me through workshops, factories, businesses, exhibitions, and so much more. I hope to study Design Engineering at Imperial and then... not a clue where I will go. A startup? Robotics? Build an iron man suit? Who knows!

But what I can tell you – as a child who grew up in our school's Technology block – Design and Technology is not simply a subject. It is a philosophy, a way of thinking, a method of life. A journey like no other!

Fostering inclusivity in design and technology education

Lol Conway, Curriculum Consultant

As a teacher of design and technology I have constantly strived to foster inclusivity, ensuring that every student, regardless of their abilities or needs, can fully engage in my lessons. Since joining the Design & Technology Association, my passion for championing the success of students with SEND (Special Educational Needs and Disabilities) in our subject has intensified from speaking to so many teachers wanting advice and guidance in this area as well as meeting teachers and visiting establishments working so successfully with these students.

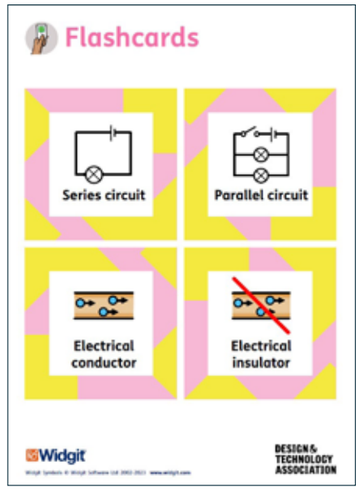


At the Association we are constantly looking at ways to ensure *all* students are supported with the highest quality of teaching from the wonderful teachers we have teaching our subject and so will be continuing to develop ideas and resources for SEND students in mind.

New Widgits

As part of our ongoing work we have looked into accessible symbols that are predominantly used for people with learning disabilities. Whilst Widgit had already introduced some of these symbols for our subject, it was evident that the landscape of technology and our subject's ever evolving requirements necessitated more specific and updated versions.

The comprehensive resource of accessible symbols has been created in conjunction with Widgit and has resulted in an invaluable resource for teachers wanting to make accessible materials for their D&T rooms and teaching/learning resources. They can be used in Primary, Secondary and Specialist SEND settings depending on the needs of your students.



Sue White, Senior Education Specialist at Widgit, commented:

'It has been a pleasure to work with the Design & Technology Association and support them in their aim to be more inclusive within their area of expertise. Our symbol designers have enjoyed creating symbols for the specific tools and concepts within Design and Technology and we are looking forward to including the full set of new Design and Technology symbols on our symbol database in the coming academic year.'

Adding visual support

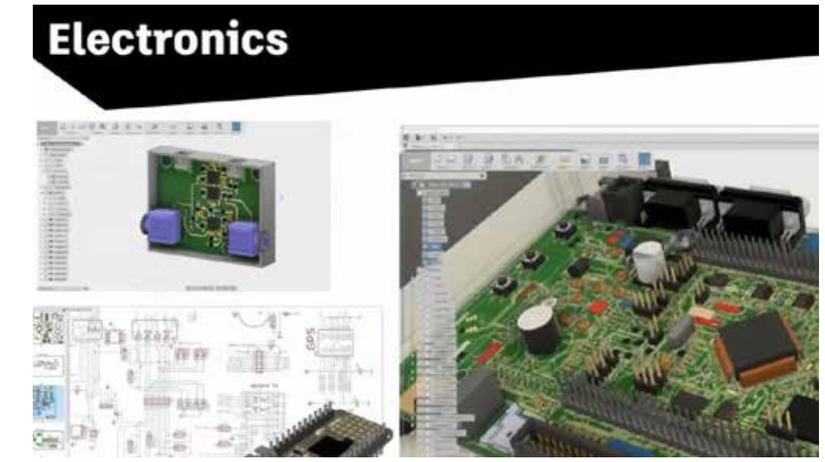
The resource uses pictorial symbols, either as an alternative to text or to accompany it. It adds visual support to the printed word, opening up the world of information to those who may otherwise be excluded from it. These can also be used to reduce EAL language barriers, enable independent learning, create social stories, labelling tools and equipment and much more. Schools can use these downloadable PDF D&T symbols as they wish, e.g. cut, paste, resize.

You can find PDF versions of these symbols on our website www.designtechnology.org.uk/resource-shop/sen-communication-symbols/ with the first set of 40 free for all schools. We then have an additional 40 symbols for D&T Association members and if you have the Widgit InPrint 3 software you can also access these in a wordlist format.

It is imperative that all students regardless of their needs feel supported in design and technology and we are dedicated to fostering an inclusive and enriching learning environment so that students have the opportunity to experience success. We feel that these accessible symbols will hopefully help to support all of the hard work teachers are already doing in the classroom to make this happen.

Autodesk Fusion 360 Webinars

The Design & Technology Association hosted an educational webinar delivered by our Blueprint 1000 member, Autodesk. The event focused on unveiling the potential of Fusion 360, Autodesk's cutting-edge design and engineering software, and its transformative impact on educational settings. This exclusive webinar brought together educators, from high schools to universities to explore the dynamic capabilities of Fusion 360.



AUTODESK Fusion 360

Fusion 360

The session kicked off with an insightful overview of Fusion 360's comprehensive features, delivered by Autodesk's expert presenter Oliver Briggs. Oliver delved into Fusion 360's capabilities, ranging from 3D modelling and parametric design to simulations and manufacturing processes. He highlighted real-world success stories, showcasing how educators have seamlessly integrated Fusion 360 into their curriculum, resulting in enhanced student engagement and skill development.

Case Study

One inspiring case study shared during the webinar involved a secondary school where students utilised Fusion 360 to design and manufacture components for a robotics competition. The iterative design process facilitated by Fusion 360 not only provided hands-on experience but also nurtured critical problem-solving skills among the students.

Another noteworthy example came from a university engineering course where Fusion 360's parametric modelling and simulation proved instrumental. Students, tasked with designing a complex mechanical assembly, demonstrated a profound understanding of engineering concepts and their practical application.

Vocational Training

The positive impact of Fusion 360 in vocational training was highlighted as well, with a technical college successfully incorporating the software into its machining program. Students were able to bridge the gap between design and manufacturing, gaining valuable insights and preparing for future careers in the industry.

Unique Features

The software includes Generative Design, a cutting-edge concept utilising machine learning and aspects of artificial intelligence to create optimal designs based on defined parameters, such as loads, materials, and manufacturing methods. In addition to this, the software's cloud-based nature facilitates collaborative work, providing flexibility for users to access their data from various devices and locations.

Fusion 360 supports iterative design through its timeline feature, allowing users to revisit and modify previous steps, fostering problem-solving skills.

Fusion 360 provides tools for rendering and visualisation, allowing students to create realistic images and animations of their designs for presentations or research and development.

Learning and Implementation

Educational resources, including videos are available on Autodesk's website and the Fusion 360 YouTube channel, making it accessible for users to enhance their skills. Autodesk can offer personal assistance, encouraging users to reach out for support, whether through community forums or direct communication via email or scheduled calls.

Fusion 360 Fundamentals courses are available and are free for Design and Technology Association members, offering live instruction and interaction, providing a structured learning experience for users. Access to Fusion 360 for educational purposes is free, and Autodesk aims to simplify the process for users, making the software readily available for teaching and learning.

We extend our gratitude to Autodesk for delivering an engaging session that left an impact on the educators who attended.

If you missed the webinar or have further questions, we encourage you to connect with us.

Email:
blueprint1000@designtechnology.org.uk
for more information.

Links

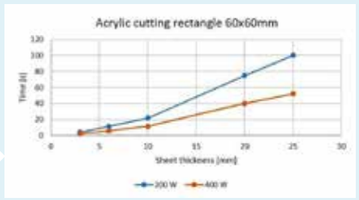
Blueprint 1000: Autodesk
www.blueprint1000.org.uk/member-directory/blueprint1000-2/

Autodesk Fusion 360www.autodesk.co.uk/products/fusion-360/overview?term=1-YEAR&tab=subscription

Harnessing laser power

The crucial role of laser power in laser cutting and engraving applications
Alex Beckingham, Applications Engineer, Trotec Laser UK & Ireland

Laser technology has emerged as a transformative force across industries, providing businesses with precise and efficient solutions for cutting and engraving applications. In these processes, laser power is a fundamental factor that significantly influences the outcome of cutting and engraving operations.



Higher laser power saves time when cutting thicker acrylic sheets.

Opportunity

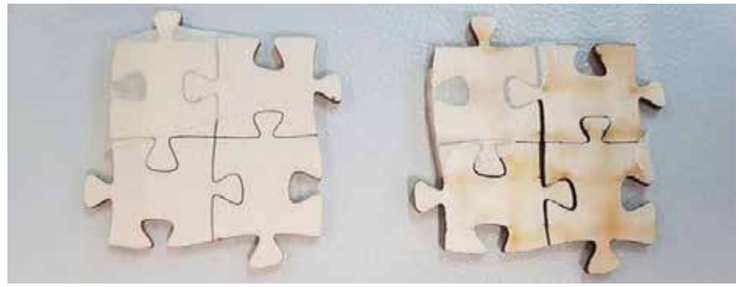
Laser power denotes the energy delivered by a laser beam within a specific timeframe and is commonly quantified in watts (W) or kilowatts (kW). Laser cutting and engraving systems encompass a broad spectrum of power ranges, from a few watts to multiple kilowatts. The power output dictates the intensity of the laser beam, thereby directly affecting the speed, depth, accuracy, and versatility of the cutting and engraving processes.

Cutting applications

Laser cutting has the ability to yield immaculate and precise cuts in an array of materials, including wood, plastics, and fabrics. The power of the laser is important in achieving optimal results for various material thicknesses and compositions. Higher laser power means faster cutting speeds, indispensable for large-scale industrial production.

The power density of the laser beam interacts with the material, causing it to melt or vaporise, enabling a clean and precise cut. Laser power also governs the cutting quality, as inadequate power settings may result in incomplete cuts or unsatisfactory surface finishes. However, when dealing with finer materials such as

Adjusting power settings will achieve different cutting and engraving results. This example shows a piece of card which has been cut and engraved with varying degrees of intensity and detail.



The jigsaw on the left, a jigsaw has been cut with a higher beam quality typical of ceramic and metal tubes; on the right a DC laser beam (typically a glass tube) has been used.

paper, certain textiles and thin plastics, the best results come from striking a balance between power and speed to prevent burning. Excessive power can char the material and reduce the level of engraving detail, so it is important to use high-quality laser equipment where the stability and control over laser power are finely tuned.

Engraving applications

Laser engraving is the process of etching designs, patterns, or text onto surfaces. The depth and speed at which the laser removes material during engraving are influenced by laser power. Higher-power lasers can expedite material removal, thereby reducing engraving time. Laser power affects the degree of intricacy and detail attainable in the process. As with cutting delicate materials, fine lines and intricate designs often require lower power settings to ensure precise etching without compromising the structural integrity of the material. An 80W laser will finish the job approximately 2.5 times faster than the same laser system using a 30W source.

However, it is important to bear in mind that each laser tube has a window for optimal operation and therefore a point of diminishing returns is reached once you go beyond these ideal parameters. For example, if you want to engrave a delicate material which requires a low power setting of 10W, you will see far better results using a 30W laser source than you would with a 400W laser.

Material considerations

Materials respond differently to laser power. While certain materials require more power for effective cutting or engraving, others are more sensitive and require lower power to avoid heat damage.

Tubes and beams

The type of laser tube can significantly affect laser power. Glass, ceramic, and metal laser tubes are common options with distinct characteristics. Ceramic laser tubes are widely regarded for their stability and precise control over power settings. They allow for finer adjustments of laser power, providing operators with greater flexibility to optimise cutting and engraving results. On the other hand, glass laser tubes, often found in low- to mid-range laser systems, may offer adjustable power settings, but generally provide less precise control.

Another factor is beam quality. Ceramic and metal lasers have a far superior beam quality compared to glass-tube lasers. Although both have the same peak-rated power, the outcome and processing time can vary greatly depending on the application. The choice between ceramic, glass, or metal laser tubes should take into consideration factors such as power needs, control capabilities, stability, and overall system performance.

Striking the balance

As well as laser power and speed, other factors can also influence results. For example, the type of motor used to run the laser head (i.e. servo or stepper) can affect detail as well as speed, while good extraction will reduce flaming or charring and can minimise cleaning the material after processing. Prudent selection of the appropriate laser power for specific materials and applications is critical to achieve optimal outcomes. By learning the relationship between laser power and different materials, users can unleash the full potential of laser technology, thereby striking the right balance of precision, quality and speed to meet specific production goals.

About Trotec

Trotec is a leading international provider of laser systems for a wide range of applications, from laser cutting and engraving to industrial marking. The company's extensive line of quality laser engravers, cutters and markers, coupled with its unmatched service and support offerings, have made Trotec one of the industry's leaders. Trotec offers also software, a line of exhaust systems and engravable materials. Trotec's machines are currently in use in over 90 countries around the globe.

For more technical advice, hints and tips, or to book a laser demonstration, visit www.troteclaser.com

Fuelling passion and ingenuity:

Baysgarth School's D&T renaissance

For far too long, D&T and Engineering have suffered from a reputation as being less exciting and relevant compared to other academic disciplines. As students gravitate towards subjects perceived to offer more immediate career prospects, the number of learners opting for D&T at GCSE level has witnessed a downward trend. However, amidst these concerns, a remarkable story of transformation is unfolding at Baysgarth School, where the Design Technology and Engineering department (DT&E), under the dynamic leadership of Ben Wilson and Andrew Browne, is revolutionising the way students perceive and embrace these subjects.

Notably, the efforts of Wilson and Browne have garnered attention beyond their institution. Recognising their innovative approach and dedication to revitalising DT&E, the Design & Technology Association recently visited the school with a mission to learn from the pair's experiences and uncover the secrets behind their spate of successes via a podcast mini-series, titled 'Baysgarth School: An Engineering Journey[1].

Shaping a dynamic curriculum

The D&T department has crafted a dynamic curriculum that nurtures creativity and skills development. 'Greenpower' lies at the heart of this approach, integrating sustainable engineering practices into the realm of motor racing. The curriculum also emphasises strong employability skills, ensuring students are exposed to real-world scenarios that foster problem-solving, teamwork, and effective communication. In recognition of this work the school was awarded Centre of Excellence status in January 2022.

Wilson and Browne's hands-off approach allows students to take ownership of their projects, fostering an environment of collaboration and respect. Do not mistake the strategy as complacency, the autonomy garnered from the approach nurtures individual creativity and instils core values of responsibility and resilience, empowering students to overcome challenges and push the boundaries of what is possible.

Richard Briggs, Head of Baysgarth School, noting: *"The best thing I have seen in my 30 years of education is the children that we have doing the Greenpower electric cars and project: I have never seen anything like it for developing personal and employability skills. Our teachers don't give a single child a single answer... they get the children to work in teams, decide roles, problem solve, and become leaders"*. He also notes in his interview that the DT&E department achieves the highest outcomes consistently year on year, believing that this engaging curriculum, specifically at Year 9, serves that success.

These are the moments that make Wilson and Browne proud. With the students leading the way, Baysgarth teams have qualified for the Greenpower International Finals every season they have entered.

Engaging the wider community

Despite budget constraints, the D&T department at Baysgarth School has cleverly fostered collaboration and practical application within the wider community. Strategic partnerships with local businesses like Wren Kitchens and Prax Oil Refinery have provided not only financial relief but also transformative experiences for learners. These partnerships offer transport to tracks and immersive encounters, infusing the educational journey with real-world relevance and hands-on learning.

Parents interviewed in the podcast mini-series expressed their appreciation for the inclusive approach of the department. The department's efforts in attracting girls to the field and nurturing a diverse student body have been recognised and celebrated. Parents value the fundamental 'human' skills that their children develop through D&T, skills that are often not accessible in core subjects.

Charting the path ahead

The journey of transformation for Wilson and Browne at Baysgarth School's D&T department is ongoing. In a remarkable display of whole school involvement, Andrew Browne, in his dual role as a teacher and Head of House, launched a challenge to collect plastic waste from the community. Students embraced the task, resulting in the recycling of an astounding 20,000 plastic bottles. This initiative not only reduces material costs for the department, but also protects the local environment and imparts valuable life lessons on sustainability. By involving the entire school community, DT&E education ensures it extends beyond the classroom, having students make conscious choices and fostering a culture of environmental responsibility. The recycled material has been used on both Goblin and F24 cars, securing a Greenest Bodywork trophy at the 2023 Hull Gathering of Goblins and Blyton 2023 Siemens Sustainability Award.

To further aid Barton-Upon-Humber and the surrounding area, the school is committed to investing time and budget in a dedicated *STEM Lead* role and creating opportunities for local students to embrace the 'find a way or make one' ethos further. With these plans in place for the 2023/2024 academic year, future initiatives include the establishment of the nation's first school race track, where students from across the region can test their Greenpower electric cars in-house. Wilson and Browne are also in the process of seeking funding for a sustainable STEM Centre where students can experience first-hand how to become more carbon neutral.

The future holds great promise for Baysgarth School's D&T department, the school itself, and its learners. The dedication to nurturing passion, the focus on innovation and sustainability, and the commitment to inclusivity set a shining example for others in the field. The future is indeed bright for Baysgarth School, its visionary educators, and, most importantly, its eager learners.

Link to podcast

www.designtechnology.org.uk/for-education/media-video-and-podcasts/podcasts/baysgarth-school-an-engineering-journey-part-1/

Enhancing Educational Engagement at Foster + Partners

Foster + Partners

Foster + Partners recently hosted four educators and a careers advisor as part of the D&T Association's transformative Teachers in Residence programme. Led by Peter Garstecki, Education Manager at Foster + Partners, the placement aimed to introduce the intricacies of architecture, engineering, and design from an industry perspective to all of the attendees.

About Foster + Partners

Foster + Partners is a globally renowned architectural and design firm, founded by Sir Norman Foster in 1967. It's recognised for its innovative and sustainable approach to architecture, with a diverse portfolio that spans iconic structures, urban planning and interior design. Foster + Partners has played a significant role in shaping modern architectural landscapes and has been involved in the creation of some of the world's most iconic buildings and infrastructure projects.

What is the Teachers in Residence Programme?

The Teachers in Residence programme, offered by the Design & Technology Association, is a fantastic opportunity for Association members to take part in a three to five-day internship within a UK-based design, architecture, engineering, manufacturing, or construction business. This immersive experience is designed to provide educators with an in-depth understanding of modern industry, offering insights into the knowledge, skills, and personal attributes sought by employers. This firsthand experience will not only enhance awareness of career pathways but open the door for future networking opportunities and collaboration. This initiative is supported by the Institution of Mechanical Engineers (IMechE) and successfully matches educators with companies, providing a comprehensive 360-degree view of working in industry.

Contact info@designtechnology.org.uk for more information on how to take part and to find out about future opportunities. To qualify, participants may need to commit these days as holidays or secure release from their schools.

Impact on Attendees

The placement, while intense, proved to be rewarding. The attendees gained valuable insights into architecture, engineering, and design, acquiring skills which they found stimulating and useful for future teaching. Engaging moments with industry professionals during the placement fostered professional development and networking which everyone found valuable. Many commented on how the exposure to diverse apprenticeship presentations broadened their perspectives and opened up ideas about career route possibilities. Less commonly known career paths include UX/UI design and game design which are emerging fields with great demand. All commented that they wished to continue to collaborate with Foster + Partners in the future and continue to explore ways to incorporate real-world projects with classroom activities.

Impact on the Organisation

The program sparked meaningful discussions within Foster + Partners as an Organisation, particularly on product design and influencing government policies to enhance design and technology subjects. Internal conversations now revolve around aligning with educational scopes and enriching the design and technology curriculum. They want to continue to help spread awareness and understanding about the roles within the architecture field beyond the commonly perceived notion of an architect's role.

Future Collaborations and Expansion of Opportunities

Foster + Partners plans to sustain connections with educators and students, considering potential projects and collaborations with the Association as part of their commitment to bridging the gap between education and industry. This initiative aims to spread awareness about roles within the architecture field beyond conventional perceptions. Furthermore, discussions are underway for collaborations with university-level students and organisations focusing on underrepresented groups, expanding opportunities for aspiring architects.

The Teachers in Residence Programme remains a successful initiative with positive feedback from all parties, fostering collaboration between industry leaders like Foster + Partners and educators. The program not only enhances learning experiences for teachers but also provides valuable insights for students, bridging the gap between education and industry.

Read more about the placements:

Susan Harris placement at Foster + Partners
www.blueprint1000.org.uk/case-studies/susan-harris-placement-at-foster-partners/

Amy Clegg placement at Foster + Partners
www.blueprint1000.org.uk/case-studies/amy-clegg-placement-at-foster-partners/

Matt Fawcett placement at Foster + Partners
www.blueprint1000.org.uk/case-studies/matt-fawcett-placement-at-foster-partners/

Antoinette Kodi Pecku (Toni) placement at Foster + Partners
www.blueprint1000.org.uk/case-studies/antoinette-kodi-pecku-placement-at-foster-partners/

Elaine Caroll placement at Foster + Partners
www.blueprint1000.org.uk/case-studies/elaine-caroll-placement-at-foster-partners/

Peter Garstecki, Education Manager at Foster + Partners
www.blueprint1000.org.uk/case-studies/enhancing-educational-engagement-at-foster-partners/

Tasty Careers

Amy Crooks, National Skills Academy for Food & Drink

The National Skills Academy for Food & Drink has been running a schools challenge programme aimed at encouraging secondary students to consider the food and drink sector as an attractive and exciting career choice. There are many career opportunities in the manufacturing, hospitality, and food service sectors and the challenge offers a chance to look at supply chains, costings, product design, manufacturing, and technical requirements with a view to encouraging food businesses to engage with schools.

Early stages

The scheme was initially piloted in Wales in 2018/19 as an Enterprise and Employability challenge competition designed for schools delivering the National / Foundation Skills Challenge Certificate Welsh Baccalaureate at Key Stage 4. Approved by the WJEC, the competition enables participants to develop skills in creativity, innovation, personal effectiveness, and digital literacy. Sixty students took part in the initial pilot, with the two best teams presenting at the Taste Wales Conference in Celtic Manor Hotel, Newport.

Real-world learning

In subsequent years the challenge was developed for Year 9 students to match curriculum requirements, delivered with local food manufacturers, hotels and restaurants, and attracting a thousand students from fifteen schools. The task was to create a healthy, nutritional, and sustainable meal for a restaurant menu that could be either a starter, main meal or dessert using as many Welsh ingredients as possible.

The programme was supported and judged by Castell Howell (the main sponsor) the Seren Collection (a 5-star Hotel and restaurant group in Wales) The Beach House in Oxwich with Michelin star chef Hywel Griffiths, and Careers Wales. The winners were invited to a Michelin star restaurant to look around their kitchen and restaurant and have a celebratory meal as part of the prize.

The challenge for 2023 was changed slightly to include more information on costings and VAT. Students were asked to consider which foods are more sustainable, issues around possible allergies, gluten-free food and meals that could have vegetarian and vegan options.

Primary challenge

The Academy was contacted by the Health and Social Services Minister's office to ask if they could support a climate challenge that the Minister wanted to set up open to all primary schools in the South-West and Mid Wales. To support this they simplified the existing 'Tasty Careers Schools Challenge' asking children to look at a meal they would like to see on the school menu that was healthy and nutritious.

The brief also included looking at where the food products originated, specifically asking them to calculate the distance travelled in Air Miles and carbon footprint of the ingredients when bought from a supermarket. They then asked pupils to buy the same ingredients from a local farm shop, butcher or local supplier and compare the miles travelled to see what difference there would be. All the relevant and necessary links for research are provided in the packs to enable them to easily access the information via the internet. 12 primary schools participated in this challenge with the winning team from each school going through to a grand final.

Benefits for schools and business

The challenge helps support students to work together in teams as well as supporting their literacy and communication, mathematics and numeracy and digital skills, and Science and Technology. It provides hands-on experiences as part of their learning around nutrition as well as Health and Well-being. Engaging with local businesses offers the opportunity to mentor students throughout the challenge and allow companies to showcase the vast array of job roles and exciting career opportunities that there are within the sector and within their business. It also helps support students to make guided decisions with regards to choosing the various career options available.

One of the companies that have supported the scheme over the past six years has seen the benefits directly for them as a business. They have actively engaged with students on a variety of support programs including healthy eating in schools, inviting students into their NPD kitchens to work with chefs and support at Careers Fairs and mock interviews in the school. Three students from that original tour have gone through work experience and are now working full-time in a range of different roles. All three are being put on the Ambassador training program and they will be able to go back into schools and attend events on behalf of the company.

Plans for 2024

Following the success of the Welsh pilot and scheme the National Skills Academy for Food & Drink plans to run a pilot in England and then roll it out nationally.

The National Skills Academy for Food & Drink (NSAFD) helps UK Food and Drink manufacturers develop, grow and strengthen workforce skills and attract future talent. They promote industry career opportunities, support firms in their apprenticeship offer and match quality-checked training providers to the CPD needs of businesses.

nsafd.co.uk

tastycareers.org.uk

Affinity and beyond

The Design & Technology Association recently hosted a webinar with our Blueprint 1000 member Serif. During this they gave an overview of their Affinity software for design and technology teachers. The session covered the overall package and the unique features of its components. Further webinars will be arranged and free trials of the software are offered to teachers in attendance. Further dates are to be announced.

What is Affinity?

Affinity is an award-winning photo editing, graphic design and page layout software package for Mac, Windows and iPad. Affinity has three key components:

- **Affinity Designer:** This application is a vector graphic design tool. It is used for creating illustrations, logos, icons, and other vector-based artwork.
- **Affinity Photo:** Affinity Photo is a robust photo editing software that provides advanced editing and retouching capabilities for photographs and images.
- **Affinity Publisher:** This desktop publishing software is ideal for creating layouts, magazines, brochures, and other printed or digital publications.

What makes it different?

Affinity's suite of applications shares an intuitive user interface. This similarity in design makes transitioning between different applications in the suite much smoother compared to rival packages.

During the webinar some unique characteristics of the software were demonstrated, for example, Affinity Photo offers advanced non-destructive editing capabilities. Users can edit images without permanently altering the original file, allowing for more flexible and reversible adjustments.

Affinity also supports a wide range of file formats, making it compatible with popular industry standards. The software is known for its regular updates and a growing community of users who provide support, tutorials, and resources making it easy to learn and implement in the classroom.

Affinity software takes advantage of modern hardware, resulting in excellent performance and faster processing. It's known for its efficient use of system resources, making it a preferred choice for users with less powerful computers.

There is also access to a vast library of assets, including brushes, templates, fonts, and more, within the software to promote creativity, and additional add-ons are available from the website store. The user interface is designed to keep the focus on creative work by minimising distractions and offering a clean, clutter-free workspace for designers.

Affinity's applications are also available on iPad, allowing for seamless cross-platform work. Projects started on a computer can be continued on an iPad and vice-versa.

Cost-effective alternative

Perhaps the most significant advantage of Affinity software is its cost-effectiveness. Rather than opting for a subscription model preferred by other rival packages, the one-time purchase pricing model for Affinity products makes the software a more budget-friendly option for professionals, small businesses, and educational institutions. Platform-specific or cross platform versions can be purchased.

Affinity software's unique combination of features, cost-effectiveness, and continuous development has made it an increasingly attractive choice for creative professionals and educators.

The Serif story

Serif Software originally developed a suite of Windows page layout and graphic software in the late 1980s, undercutting the more expensive packages aimed at professional users, but which contained a range of sophisticated tools and features. Upgrades were developed and made available, and the range was added to with video and website development packages. Relaunched in 2014 their focus moved away from the wide-ranging suite and on to the current Affinity products which were developed over the following five years and updated versions released since then.

The company has received a number of awards from industry bodies and commentators, particularly in recognition of its low cost but comprehensive features and the support available to users.

Links

Home - Blueprint 1000®

Affinity – Professional Creative Software (serif.com)

Award-winning creative software for students and teachers (serif.com)

Introducing the Bamboo Bicycle Club x Bradfield Design

BRADFIELD COLLEGE

BAMBOO BICYCLE CLUB

Discover the fusion of sustainability, design aesthetics, and STEM principles in the groundbreaking "Beyond Bradfield" workshop, a collaborative effort by The Bamboo Bicycle Club and Bradfield Design. This transformative initiative goes beyond traditional bicycle building, serving as a gateway to intricate engineering challenges.

The Bamboo Bicycle Club, in collaboration with Bradfield Design, is proud to launch an experiential workshop that merges sustainability with design, enriched by STEM principles and cross-curricular learning. This initiative is aimed at providing a comprehensive understanding of bicycle building, serving as a gateway to more complex engineering challenges.

Community

As part of "Beyond Bradfield", a commitment to support the wider community, the workshop will be extended to other schools. The Design Centre opens its doors to everyone, offering an opportunity to master the art of crafting bicycles from eco-friendly bamboo.

Students are invited to experience the joy of hands-on work and indulge their passion for cycling. Guided by Head of Design at Bradfield College, Nick Mills and supported by Bamboo Bicycle Club founder James Marr, participants will embark on a journey from concept to completion. This includes frame design, jig setup, working with bamboo and natural composites, bicycle maintenance, and safe riding practices.

Bamboo Bicycle Club

Since 2012, the Bamboo Bicycle Club has been training individuals in bamboo bicycle building and has established partnerships globally, including educational institutes. These efforts not only enhance transport mobility but also contribute to extensive research into bamboo's applications in bicycle manufacturing.

Sustainability

Nick is passionate about sustainable design and materials with a negative carbon footprint. His journey in bamboo design began in 2012, culminating in his own bike frame in 2020. Bamboo, renowned for its strength and environmental benefits, absorbs 30% more C02 than traditional timber, making it an essential material for future design and achieving net-zero goals.

Bamboo is also one of the fastest-growing plants on Earth, with some species growing up to 91 centimetres (36 inches) in a 24-hour period. Its rapid growth makes it an incredibly sustainable and renewable resource.

Material Strength

Bamboo exhibits remarkable strength and durability. It has a higher tensile strength than many traditional materials, making it suitable for various applications, including construction, furniture, and, as seen in the article, bicycle frames.

Nick brings his experience and passion to the bike-building courses. His team promises a unique learning experience at Bradfield College. He eagerly anticipates seeing students and staff embrace bamboo bicycles for everyday use, touring, and racing.

We will be introducing a free resource from Bamboo Bicycle Club. Look out for further announcements on the Design & Technology Association website.

" I am thrilled about the collaboration between Bradfield Design and the Bamboo Bicycle Club. This partnership not only allows us to delve into the fascinating world of sustainable design but also provides students with a unique hands-on experience. Crafting bamboo bicycles goes beyond the workshop; it's a journey of innovation, environmental responsibility, and the integration of STEM principles. Together, we are pedalling towards a future where sustainable design is not just a choice but a way of life." -

Nick Mills, Leader of the Design Centre at Bradfield College

Mark your calendar for British Science Week!

Although British Science Week is still months away on 8th – 17th March (mark your calendars!), teachers can start planning now. No need to spend hours scrolling on the internet though! Primary Engineer's fully-funded whole-school STEM competition is perfect for the 10-day celebration of science, technology, engineering and maths.

British Science Week

British Science Week is an annual event that celebrates science, technology, engineering, and mathematics (STEM) across the United Kingdom. Organised by the British Science Association, the week-long initiative aims to engage people of all ages in various science-related activities, events, and discussions. It provides a platform for scientists, educators, and the public to come together, fostering a deeper understanding and appreciation for the importance of science in our daily lives. British Science Week encompasses a wide range of activities, from school-based projects to community events, promoting curiosity, exploration, and involvement in the world of science. Primary Engineer is here to help you celebrate this important initiative.

Primary Engineer

Primary Engineer serves as a valuable resource for Design and Technology teachers, providing practical support and a range of programs to enrich classroom learning. With a focus on inspiring future engineers and innovators, the organisation offers educators access to hands-on projects and challenges. Dedicated to fostering creativity and critical thinking, Primary Engineer plays a significant role in shaping the educational landscape and preparing students for the opportunities in design and technology.

STEM Competition

Open to all schools in the UK, this UK-wide competition which asks pupils aged 3 – 19 'If you were an engineer, what would you do?' is a great way to introduce your pupils to the fascinating world of science, technology, engineering and maths. Join us in nurturing a passion for STEM education and inspiring the engineers and innovators of tomorrow!

What does it involve?

Pupils are tasked with interviewing an engineer (arranged by Primary Engineer), where they get a better understanding of what engineering is, the career pathways involved as well as the opportunity to ask the questions that matter to them. The interview gives pupils the inspiration to come up with their own engineering ideas to a problem they identify whether that's a problem relatable to themselves, their community or the world around them. The cross-curricular competition asks pupils to draw and annotate a solution to the problem whilst also writing a persuasive letter to tell the inspiring engineer about their solution and why it should be brought to life.

What are the benefits?

The competition boosts pupils' confidence in the classroom as every single pupil who takes part is recognised with a personalised graded certificate, with all entries that are submitted being read and graded by professional engineers. Entries are graded based on the quality of the idea, not the art skills or spelling of the letter so is suitable for all pupils regardless of academic ability and educational needs. In addition to fostering confidence in the classroom, the competition provides a unique opportunity for students to receive personalised recognition. Every participant, regardless of academic ability or educational needs, is acknowledged for their efforts.

Pupils build lasting memories at our regional exhibitions and awards ceremonies where their amazing, joyous and innovative ideas are showcased and celebrated.

Thanks to the support from Primary Engineer's National and Regional Partners, the competition is fully-funded and free to all schools.

When you register on their website, it unlocks access to cross-curricular lesson plans, pupil log-books, guides and curriculum mappings to help you teach STEM easily with a flexible approach in the classroom.

How do we get involved?

Simply register for free on the website here: leadersaward.com/resource-area-registration/

Injection Mini Machine

In the ever-evolving landscape of Design and Technology, staying ahead of the curve is essential. One company leading the way in innovative, sustainable solutions is Sustainable Design Studio, and they've just introduced a game-changer for educational settings: the Injection Mini Machine.

About Sustainable Design Studio

Since its creation in 2020, Sustainable Design Studio has helped hundreds of clients across the world convert plastic waste into something new using their custom designed machines and moulds. They're committed to providing eco-friendly solutions that contribute to a more sustainable world. One aspect of their work is their involvement in education. By designing machines to be used within education, schools can provide students with hands-on experience in recycling. Students can bring in their household plastic waste and convert it into new and exciting products in the classroom.

The Injection Mini Machine

The new Injection Mini Machine is ideal for encouraging students to explore plastic injection moulding processes, widely used in many industries, including automotive, aerospace and consumer goods. The Injection Mini Machine is a desktop injection moulding machine designed for small business and educational institutions that allows for the creation of high-quality plastic items. It's ideal for prototyping, small-scale production, and educational projects.

Compatible with most of Sustainable Design Studio's existing modular and premium moulds, the Injection Mini can be used to create new products from recycled plastic such as buttons, beads, flower pots and combs. With an easy single button operation, students can gain practical experience in plastic injection moulding in the classroom. Sustainable Design Studio also designs and fabricates custom moulds, so if students want to design a product for a project, it is possible to create a mould and see the product truly come to life.

Safety First

The Injection Mini Machine has a fully enclosed design and intelligent sensor system and has been designed to fit with Sustainable Design Studio's Fume Extractor or any 150mm (4") extraction system, meaning teachers can introduce their students to the process without compromising their safety.

Recycling Simplified

This approach offers an ideal platform for demonstrating plastic recycling processes. The increased barrel size allows plastic bottle tops to be added directly into the machine without the need for shredding or additional preparation. This approach simplifies recycling, enabling students to witness firsthand how plastic materials can be repurposed with less machinery required. If required, Sustainable Design Studio have also created the Shredder Basic Machine, with advanced safety features, so it is possible to shred a wide range of household plastics while ensuring that no fingers can get anywhere near the shredding mechanisms.

Using these machines students can engage in practical design and manufacturing projects, starting with the collection and shredding of plastic waste and culminating in the creation of custom-designed objects or prototypes, deepening their understanding of recycling and sustainability, making a difference one plastic bottle at a time.

If you have a project that uses the application of injection moulding techniques that you would like to share, please get in touch with the D&T Association.

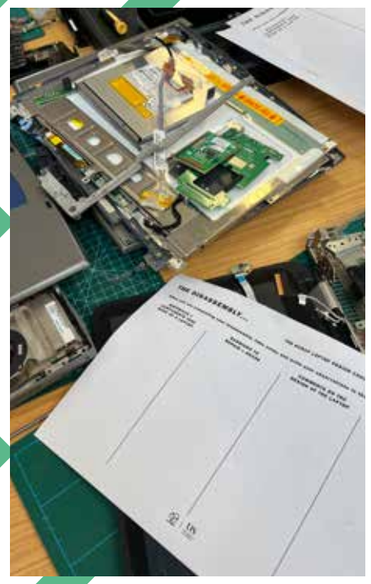
www.sustainabledesign.studio/

The Reimaginarium

Design and the circular economy

Claire Potter, Senior Lecturer at the University of Sussex

For many, the term 'circular economy' is not a familiar one. Some may say they saw it once in an article, that they recall someone mentioning it on the news once, or perhaps that they saw a company proudly stating that they were 'part of it' on a piece of packaging. But what exactly *is* it?



Whenever I talk about the circular economy, I cut the complexities and reframe it. *The whole of nature does the circular economy – but humans don't.* For example, in the beginning a leaf grows, which is then eaten by a caterpillar, which is then eaten by a bird. In time, the bird reaches the end of its life and falls to the foot of the tree, naturally decomposing, nourishing the earth and allowing the tree to grow more leaves. The end is looped back to the beginning. Nothing is wasted, no 'rubbish' created, and everything works in harmony. Regardless of your background, age or location, everyone understands circularity in the context of nature. The circular economy is much more complex and nuanced than this, but it illustrates the general premise beautifully.

So it is quite a sobering to think that we are the only species on the planet that does not effectively work in this way. Instead of circularity, we mostly work in a linear, or at best a recycling economy. We take something out of the ground, we turn it into a 'thing' (a car, a jumper, a building, a toy rabbit), we use that thing for seconds, days or years and when we are done with it, we chuck it away. Take, make, use, dispose. With all the energy, emissions and waste that gets created along the journey – exploiting people and planet in the name of profit.

Designers' dilemma

Explaining this to anyone can be a lightbulb-style nightmare revelation, but for designers – the creators of the 'things', this strikes right at the very heart of what we do. We may be graphic designers or UX designers helping to 'sell the thing', we might be fashion, automotive or product designers helping to 'invent the thing', we might be manufacturing designers helping to 'make the thing'. I often start design lectures at the University of Sussex saying that 'with great power comes great responsibility', but wow. How many of us really appreciate the planetary power we actually have.

There is of course the possibility that this can lead to utter despair. Once we understand how far humans have come from how nature works, how bad things have become and reflect that we are all part of the problem, eco-grief and eco-anxiety can creep in like dark shadows over our hope. But I like to flip it into an opportunity, and an exciting one. Designers love exciting opportunities.

All the Rs

We can look at the 'Reduce, Reuse, Recycle' mantra that was popularised in the 70s/80s, reflecting on how we missed the opportunity of the first two – Reduce and Reuse – in the name of 'Recycling', which has been the wrong industry go-to for too long, pushing the destructive and highly inefficient process onto the conscious of consumers. What would happen if we embraced Reduction and really questioned if we actually *do* need that new thing? Or if things we designed had Reuse at the heart?

We would then open our eyes to the multitude of other Rs that form the circular economy, such as Repair, Refurbishment and Redistribution. How exciting to think that something you create could be designed to have multiple lives – maybe stretching over multiple sectors before it is finally (and really only as a last resort) Recycled?

New paths

Instead of specifying virgin materials which have been created from fossil fuels, or from destroying the natural world, we turn our lens onto waste streams to see undiscovered opportunities. Nature doesn't do waste remember, so what possibilities are locked up, unseen, unused and waiting for creative minds to discover them. Technical and biological waste streams that would otherwise be wasted could be redirected into new applications.

What about the sharing economy? How many incredible interventions could we create from re-establishing communities in person and online who work together to access an item rather than owning it? Design will sit right at the start of this process too, creating new platforms for products that are robust, repairable, trackable, with longer use lives and upgradability.

None of us can deny that we are living in deeply challenging times, in so many ways. But we should always remember the Design Council statistic, that 80% of a product's environmental impact is decided at the design stage. What an opportunity to grab hold of! The future is uncertain, but designers make imagination a reality. So how incredible a world can we Reimagine together...?

Claire Potter is a Senior Lecturer specialising in design and the circular economy and Course Convenor of the BSc / BA Product Design programme at the University of Sussex. Illustrations in this article have come from Claire's book *'Welcome to the Circular Economy – the next step in sustainable living'* which is published by Laurence King.

Natural Entrepreneurs
Biomimicry in action

Richard Dawson and Lewis Winks

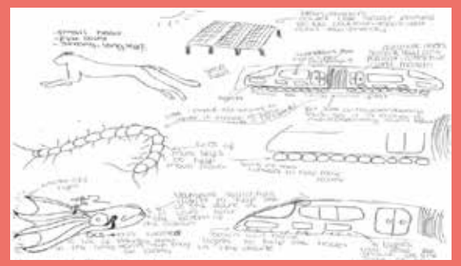
Biomimicry means to *copy life*. From a biomimicry perspective, there are no unsolvable challenges, only a range of solutions. Nature meets challenges through a series of functions and strategies, which elegantly overcome or transform the challenge with minimal expenditure of energy or resource.

A kingfisher provided the inspiration for an improved and more aerodynamic bullet train; termite mounds teach us about principles of passive heating and cooling of buildings; fungi are inspiring a new generation of computing and circuitry. The possibilities to learn from, and be inspired by nature are almost endless, but in order to do so we need to rethink how we approach design and reconsider the questions we ask and the presumptions we make. The Natural Entrepreneurs project has been guiding students at some English schools to do just that.

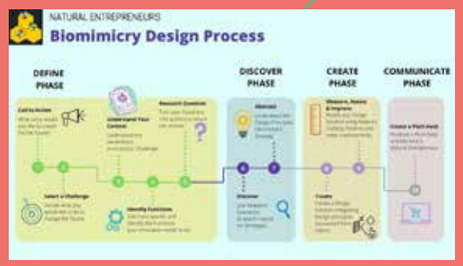
Nature and design

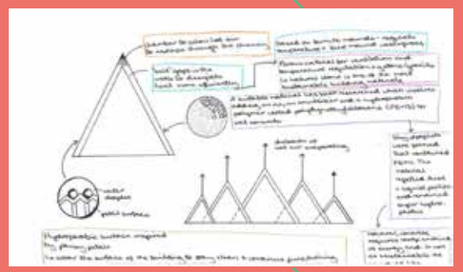
For design students at a handful of English schools, nature has been providing inspiration and guidance. The Natural Entrepreneurs project offers young people the opportunity to approach design from a different perspective – one which takes nature as a starting point. Following a design thinking pathway, Natural Entrepreneurs guides students through a series of tasks and questions which challenge them to think about what they are creating in ways which reflect how organisms and biological systems do things. An online platform supports students' learning, and encourages them to work together and to compete for points internationally against other schools and teams.

The project is set around a design pathway which begins with selecting the challenge students wish engage with – for Natural Entrepreneurs we made use of the Sustainable Development Goals as a starting point, offering a range of challenges based on goals such as Good Health and Wellbeing, Sustainable Cities and Communities, and Responsible Consumption and Production. Students then narrow the scope of their work by determining the context they will be working in by considering questions such as 'who is this design for? How might local conditions affect the design, and what will the limits be of what the design will achieve?



Rethinking public transport with night-time lighting inspired by vampire squids, streamlining inspired by cheetahs and flexible carriages gleaned from centipede movement.





A system to vent heat from buildings incorporating inspiration from termites and pansy petals.

In context

Once a context has been set, students go on to identify functions from nature which might be applied to their design – these functions then form the basis of the research question which underpins the next phase. For example, if their product needs to manage physical forces and maintain integrity, then their research question might be *'how does nature manage turbulence and tension forces?'*. Having such a research question places students in an excellent position to begin researching strategies to achieve such functions as found in the natural world. Using this example, students might go on to investigate the way that trees bend and flex in high winds, or develop more cambium growth on the prevailing wind facing side of their trunks; or they might look at the undulating surface of a humpback whale fin as an efficient way of moving through water with reduced drag.

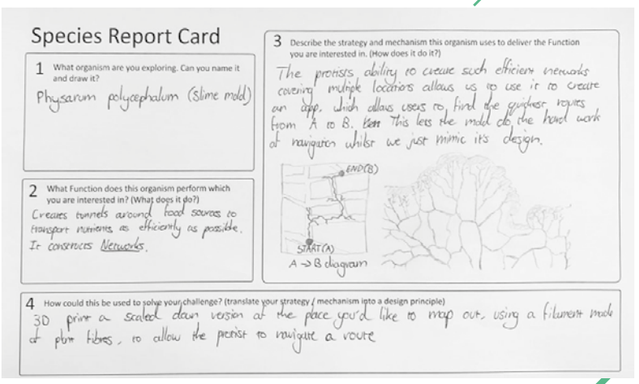
After a period of research (taking place outside, and in the classroom), students are able to apply their new knowledge of nature's strategies to their design problem, and to begin to create their design solution. This is done by making use of a set of 'unifying patterns' found in nature – nature's design principles, which can then be incorporated into the student's design. These principles can also be used as a form of evaluation or a reflection tool to help students hone and improve their designs. Finally, students bring all of their learning together into a pitch deck in order to communicate their ideas.

Slime mould shows efficient ways to map out complex routes, and has potential applications in public transport planning.

Biosolutions

Biomimicry has proven itself to be a way of engaging young people with the ingenuity of nature, in ways which are applied across a range of topics and open up an interdisciplinary basis for developing design and innovation. Natural Entrepreneurs has enabled Design and Technology students to engage with principles of ecology, while biology students have been able to consider the potential for applying natures principles outside of their subject area. While the project itself is now coming to an end, the resources we have developed together with our partner schools remain online, and the platform is available for everyone to use. We encourage you to do so, and to explore the inspiring world of biomimicry with your design technology students. Let us know how you get on!

If you would like to work with Natural Entrepreneurs please do get in touch or visit www.natent.eu. Contact Richard Dawson (richard@wild-awake.org) or Lewis Winks (lewis@lestari.org).



Scalextric4Schools

Simon Hooker, Scaletxric4Schools Race Director and Head of Design, Technology and Art The Bishops Blue Coat High School

Scalextric4Schools was the brainchild of two exceptional Design and Technology teachers at Edgecliff High School, Staffordshire; David Eyre, then Head of D&T and Chris Jarman a senior teacher. With the help of Tim Brotherhood at PTC the idea was pitched to Hornby and Scalextric4Schools was born.

It was during my teacher training some 20+ years ago now that I first met Tim who was at the time Staffordshire's D&T advisor. He would later share the draft idea for Scalextric4Schools with me. From 2009-2014 a number of teams from across the country competed in a national finals held at RAF Cosford. A team regularly travelled all the way from Russia to compete and a series was set up in Australia. Unfortunately after five years and due to a change in strategic direction, the competition was paused before being disbanded. For years I tried to keep running the project as an extra-curricular club until I finally ran out of parts.

New opportunities

Fast forward to 2021 and the aftermath of the pandemic, I felt a desire to try once more to bring the competition back as I recognised that many students had missed out on so much over the last few years. The Scalextric4Schools programme was ahead of its time. Originally conceived to give youngsters an opportunity to get involved in the world of design, manufacture and innovation so that they might be inspired to purse it as a career, schools now had greater access to the modern concepts of design, optimisation and rapid prototyping, all coming together in a competitive environment which fully embraces STEM.

With the help of Ryan Ball and the D&T Association we managed to open dialogue with Hornby and Scalextric. Over the next 18 months I personally experienced a few highs and lows including an extended period of time off due to ill health. However, rather than succumb to the illness Scalextric4School became my epiphany.

Revving up

Parts are supplied by Sandbach Slot Cars, new tutorials created and former sponsors Boxford and PDS Vison (formally Root Solutions) signed up. All this saw the Facebook group expand from under

100 members to over 1000. With my return to work and the momentum as its peak, my team at Bishops', Ant Cross and Becky Hickman, gave me their support we took the decision to do a soft relaunch. Scalextric gave their support, attended the event and provided prizes for the competition.

Back on track

The 30th of June 2023 saw the return of Scalextric4Schools. 10 teams from across the country took part in an event hosted at the Bishops' Blue Coat High School, Chester, the furthest travelling all the way from The Royal Grammar School, Newcastle who took home the Scalextric Team work award. Throughout the day the teams took turns setting lap and race times, tuning their cars trying to set the fastest 10 laps on the track.

The judges were Simon Owen and his team from Scalextric; Paul Barraclough, Managing Director Boxford; Roger French, Managing Director PDS Vision; and Ryan Ball, Director of Education at the D&T Association. The judges spoke to the teams to get an understanding of the creative and engineering journeys that they had experienced throughout the day. A highlight was from Roger French "Four pupils came to me standing neatly in a row and said: "Please Sir, we'd like to know how we get into a career in design." A truly priceless moment that made it all worthwhile.

As the competition proceeded the drivers mastered the track meaning fewer crashes and less de-slotting. The pit crews tuned the cars to get the maximum performance; weight was added in different spots to ensure better grip or traction; tires were prepped, and gears and motors started to mesh cleaner as the cars were shaken down and run in. All this saw the lap times fall and the competition hotting up.

Once the last car crossed the line and the checkered flag fell the judges scores were added together and the winners announced.

- Boxford Best Engineered Car – Abby Gate College, Chester
- PSD Vision Best Designed Car – The Kings School, Gloucester
- Scalextric Teamwork Award – The Royal Grammar School, Newcastle upon Tyne
- The Stig Award – Morgan from Abby Gate College, Chester
- Scalextric4 Schools Champions 2023 – The Drifting Donuts, Bishop's Blue Coat High School, Cheshire

Next season

2024 sees Scalextric4school being bigger and better than ever before, with OnShape webinars planned for early 2024. It also sees teams able to compete in two racing classes:

- Beginner class for schools just starting out
- Advanced class for the more advanced racers and all the thrills and spills of no magnet racing

The PDS Vison award returns in 2024 with a 'Best of British' theme to base the cars' design around, with cars ideally based of any British built car from before 2000.

Registration for the finals in June 2024 can be found at www.scalextric4schools.com or by emailing Admin@scalextric4schools.com

We look forward to seeing you on the grid.

Inspired by jewellery

Jenny Dhami, Summerhill School, Dudley

Having run jewellery clubs throughout my teaching career using resins, laser cutters and compression techniques with melting bottle tops, sublimating laser ply etc, I had never ventured out into the possibilities of metal jewellery. Inspired by my colleagues, Pinterest and a general love of jewellery, I contacted BAJ (British Academy of Jewellery) for some advice. I was met with open arms, with offers about how they could help me, so we booked onto a bespoke teachers' course for our department and a free open morning workshop with my jewellery club.

The bespoke course taught us the basics of annealing, piercing, drilling, soldering, creating textures and forming rings by using pliers to bend wire. Miranda, the course leader, is so knowledgeable and talented and it was amazing to learn such skills from a creative and passionate professional. It was so lovely to have a CPD day for our department for both learning new skills together whilst also team building. We are hoping to book on again this year, to extend and develop our skills further.

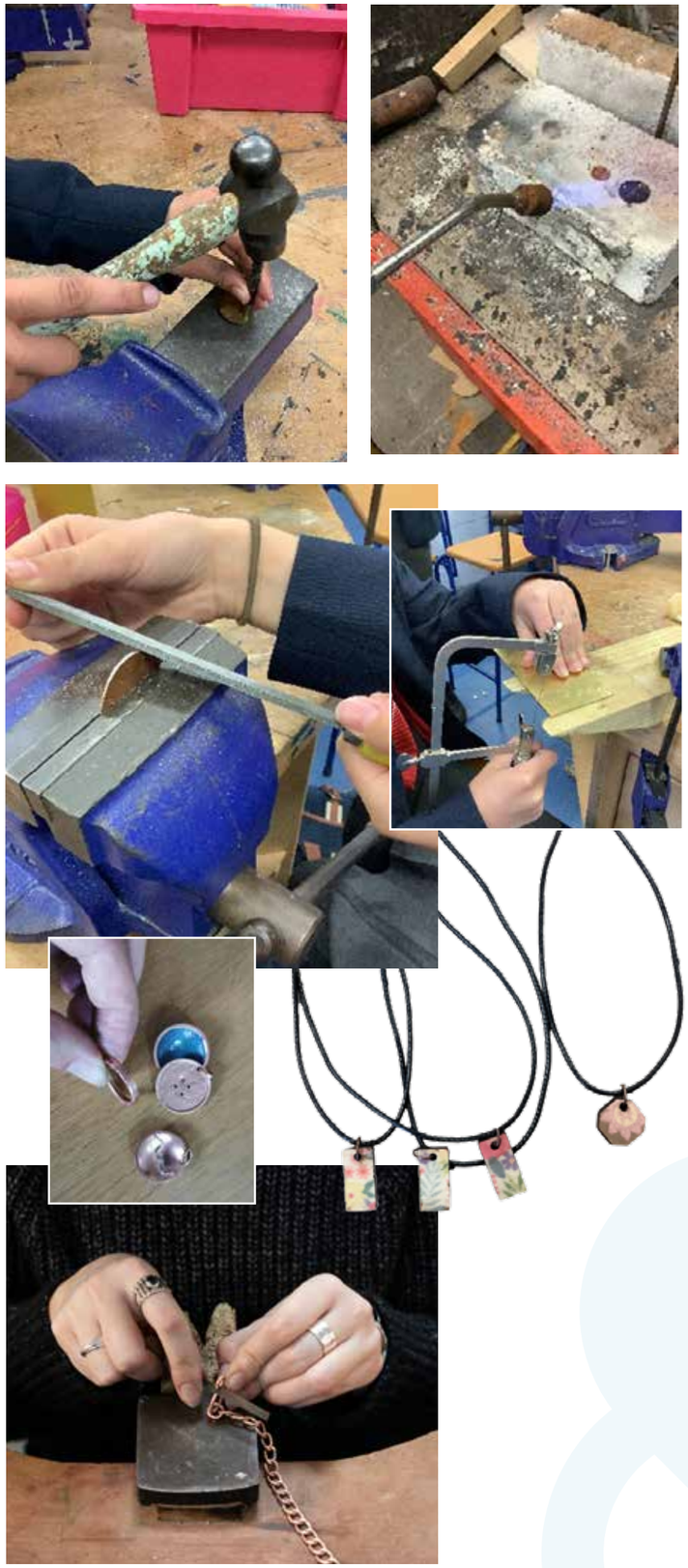
The open morning workshop with the students enabled them to learn about the diplomas and apprenticeships on offer and to also produce their own lovely keyrings in the BAJ workshop. The students loved it and all took home something to be proud of!

Returning to school, we applied for some internal funding which our school were over the moon to give to us and were lucky enough to buy the following equipment:

- Rolling mill
- Slow cooker for pickling
- Rotary tumbler for polishing
- A range of metal stamps
- Range of hand tools and materials
- Enamelling equipment

One of the parents kindly donated copper and brass to the jewellery club and we have applied for some more funding to purchase a ring gauge and triblets so we are very excited for the next phase.

The students have loved jewellery club and are excelling in their creativity and craftsmanship. It is an absolute pleasure to teach them and see them flourish, working with both metals and sublimation techniques. A massive thankyou to BAJ for inspiring us and equipping us with the skills to be able to inspire our students who may possibly be the jewellery designers of tomorrow.



BAJ

The British Academy of Jewellery is a hub for technical excellence, creativity, and entrepreneurship with jewellery campuses in London and Birmingham. BAJ offers hands-on jewellery manufacturing courses, from beginner to advanced and from short-form to multi-year.

Established as the UK's most technically comprehensive and practical introduction to jewellery, BAJ's Jewellery Fundamentals Level 3 Diploma covers jewellery design, manufacturing, 2D CAD, and theory with a strong focus on making jewellery in the workshop. BAJ also runs more advanced FE and HE courses, short courses, and online courses for global students.

BAJ graduates go on to flourish in a wealth of creative careers such as working for internationally renowned jewellers, launching their own brands, and becoming CAD designers, bench jewellers, and entrepreneurs. To get secondary and college students started on their jewellery journey, BAJ invites small student groups to the workshop to make their own keyring or pendant to take home as they try out simple yet versatile jewellery making techniques. BAJ welcomes students of all backgrounds and believes increasing diversity in the jewellery industry is the key to driving innovation.

Email
(admissions enquiries): info@baj.ac.uk

Website: https://baj.ac.uk/

Instagram: @britishacademyofjewellery

Seymourpowell is Celebrating 40th with Innovation School's Competition

seymourpowell

Renowned design consultancy Seymourpowell marks its 40th anniversary this year. Since its inception in 1983, the firm has consistently pushed the boundaries of innovation, design, and creativity, leaving a mark on industries, ranging from transportation and consumer electronics to healthcare and beyond. This milestone is an opportunity to reflect on the company's journey, their impact on design and innovation, and their vision for the future. In celebration of their four decades of design excellence, Seymourpowell is launching a special competition for KS3 pupils, adding an exciting educational dimension to their anniversary festivities.

Seymourpowell Innovation School's Competition

The Seymourpowell Innovation School's Competition is an exciting opportunity for Year 12 students passionate about making a positive impact on the world through innovative design solutions. This competition seeks projects that address real-world problems and showcase creative thinking combined with exceptional design execution. This is a great opportunity to support your students in gaining a prestigious accolade from a leading global design and innovation consultancy and ultimately positively impacting on their work and progress in the sector.

The early years

Seymourpowell was founded by Dick Powell and Richard Seymour, two visionary designers who share a passion for creating meaningful and transformative design solutions. Their early projects set the stage for the firm's future success, with groundbreaking designs for companies like Virgin Atlantic and Nintendo. These projects showcased Seymourpowell's ability to blend aesthetics with functionality, laying the foundation for the consultancy's signature approach to design.

Designing for transport and mobility

One of their most enduring legacies is their designs for the transportation and mobility sector. Over the years, they have designed everything from sleek automobiles to futuristic train interiors, always with an eye on sustainability and user experience. Their work with the automotive industry has consistently pushed the envelope in terms of design innovation and eco-consciousness.

Consumer electronics and technology

In an era marked by rapid technological advancements, Seymourpowell has consistently been at the forefront of consumer electronics design. From iconic product designs for companies like Sony and Samsung to pioneering work in the field of wearable technology, they have demonstrated an uncanny ability to understand and anticipate consumer needs while crafting products that are not only functional but also visually stunning.

Human-centred healthcare

Seymourpowell's influence extends into the realm of healthcare, where they have applied their design expertise to create user-centric medical devices and equipment. Their work has had a profound impact on the healthcare industry, making medical treatments and devices more accessible, user-friendly, and less intimidating.

Sustainability and ethical design

As the world grapples with environmental challenges, Seymourpowell has made a significant commitment to sustainability. Their work in developing eco-friendly transportation solutions, energy-efficient appliances, and sustainable packaging demonstrates their dedication to a more responsible approach to design.

The future

As Seymourpowell celebrates its 40th anniversary, it continues to look forward, exploring emerging technologies such as AI, augmented reality, and sustainable materials to drive innovation in design. Seymourpowell whole-heartedly supports Design and Technology education in schools. This upcoming competition invites young minds to showcase their creativity and design acumen and gain the chance to work on design challenges related to transportation, consumer electronics, healthcare, and sustainability, mirroring the diverse areas the consultancy has influenced over the years. The competition not only provides an educational platform for young designers but also nurtures the spirit of innovation that Seymourpowell embodies.

Join our webinar

By attending the webinar, you'll gain valuable insights into what the judges are looking for, how to approach the project, and how to align student work with the competition's goals. It's an opportunity to connect with like-minded individuals and receive guidance on how to create a compelling submission.

This webinar will include:

Introduction to Seymourpowell: Learn about Seymourpowell, some of their previous work, and their commitment to using design to create better outcomes for people, businesses, and the world.

Competition Overview: Get an in-depth understanding of the Innovation School's Competition, including its goals, eligibility criteria, and submission requirements. Gain an understanding as to the benefits of students entering.

Competition Timeline: Get information about key dates and deadlines for the competition, including the submission deadline.

Q&A Session: Have your questions answered by the Seymourpowell team, providing clarity on any competition-related queries.

Save the date for our upcoming webinar on the 7th of February 2024 to get all the competition details, guidelines, and deadlines and register via the link below.

Links

Register for the webinar: Seymourpowell Innovation School's Competition - D&T Association (designtechnology.org.uk)

Seymourpowell: www.seymourpowell.com/

Blueprint1000: www.blueprint1000.org.uk/member-directory/seymour-powell/

Nurturing creativity and innovation in a dynamic D&T curriculum

Joanna Kempston, Associate Principal

In our Barnsley and Leeds Primary Partnership (BLPP), which comprises five primary schools within our Trust (Oakwell Rise Primary Academy, Oakhill Primary Academy, The Forest Academy, Ebor Gardens Primary Academy, and Victoria Primary Academy), we have crafted a dynamic Design and Technology curriculum. Our aim is to make Design and Technology an inspiring, rigorous, and practical subject, fostering creativity, problem-solving, and teamwork among children.

Cultural capital

Cultural capital is an integral part of our curriculum, where children explore various areas of design and creation, including cooking, sewing, and constructing structures. We follow the design cycle, guiding students from product inception to completion. The curriculum emphasizes research, investigation, design, planning, making, and evaluation, with an iterative approach. We connect these subjects to real-life experiences and introduce students to renowned engineering experts through STEM and idea communication. Cross-curricular links are established, particularly with other STEM subjects.

Throughout their educational journey, our D&T curriculum spans all year groups, with each term focusing on one of the following strands:

- Textiles
- Food Technology
- Mechanical Systems
- Structures
- Electrical Systems

We meticulously map essential skills and knowledge for design and technology across the school to ensure progression from one year group to the next. Our curriculum empowers children to research, express their ideas, explore, investigate, develop concepts, create products, and evaluate their work. Design and technology lessons are taught in blocks, concentrating children's learning during each unit of work.

Skills development

Our curriculum incorporates traditional skills such as model making, drawing, problem-solving, food preparation, observation, discussion, and evaluation. These skills are amalgamated to inspire children to become designers and inventors. Importantly, the skills they acquire are transferable to other facets of their learning and the real world. We prioritize teaching children to use tools and materials safely and efficiently.

As they progress through school, pupils are provided with numerous opportunities to hone their skills in preparing food products, sewing, working with fabrics, and understanding how materials come together to create robust structures with mobility. In Food Technology, students gain a profound understanding of a healthy diet and acquire the invaluable life skill of cooking balanced meals using accessible recipes.

Through a diverse range of creative and practical activities, we impart the technical knowledge, understanding, and skills necessary for children to engage in an iterative process of designing and making. The students design and create products that consider functionality, purpose, and the end user, making them relevant to various sectors. This curriculum enables students to merge practical skills with an understanding of aesthetics, social considerations, environmental impacts, functions, and industrial practices. It empowers them to reflect on and evaluate current and historical design and technology, its applications, and its effects.

Our Design and Technology curriculum aims to empower students with practical skills, problem-solving abilities, and creative thinking, preparing them for a bright and innovative future.

We have gathered some testimonials from teachers and students to illustrate the impact of our Design and Technology curriculum:

Teacher Quotes:

Pizzas

" *The UKS2 food technology unit of making pizza was not only enjoyable but allowed the children to practice a range of skills, including measuring, kneading, cutting, and evaluating both existing products and their final piece. It provided a good opportunity to reflect on their choices and designs and create a product for a specific purpose and user."*

Graffiti cushions

" *Evaluating, designing, and making the graffiti cushions gave the children the opportunity to practice sewing skills and techniques and add a range of embellishments using a variety of joining techniques. As this was planned for UKS2, it ensured the children were building on their previous skills and trying an appropriate stitch technique. The children enjoyed this task."*

Pupil Quotes:

Pizza Design and Making

" *I found mixing and kneading the dough difficult, although it was good fun, and I learned how to make dough."*

Monster Teddy Keyrings

" *We enjoyed making these keyrings because we got to add our own designs and learned how to sew."*

Igniting Aerospace Passion in Year 9 Students

Prepare for an exhilarating journey into the world of aviation with the return of the RAF Museum Midlands' Summer Time Advanced Aerospace Residency (STAAR) programme in July 2024.

The RAF Museum Midlands is delighted to unveil the much-anticipated return of its Summer Time Advanced Aerospace Residency (STAAR) programme, set to take flight in July 2024. Geared towards enthusiastic teachers and Year 9 students across the nation, this immersive experience promises to elevate STEM education to new heights.

Year 9 Students

Crafted specifically for Year 9 (Scottish S3) students demonstrating a keen interest or aptitude in STEM subjects, the STAAR programme is a fully funded, hands-on residential camp set against the backdrop of RAF Cosford and the RAF Museum Midlands. This unique experience is designed to provide participants with an immersive journey facilitated by industry professionals.

Exploring the World of Aerospace

The STAAR programme goes beyond the conventional classroom experience, offering participants an exclusive opportunity to engage with flight simulators, take to the skies with drones, and explore the intricate world of engineering in aviation. The aim is to spark passion and curiosity in aerospace-related fields, providing students with a taste of real-world applications in a stimulating and educational environment.

How to Join the Adventure

The application process for the STAAR 2024 programme will open on Monday 5 February. Students will need to apply in conjunction with a teacher, school representative or organisation leader. Please keep your eyes peeled on our website as the link to the application form will go live at 8am on Monday 5 February. For inquiries and additional information, interested parties can reach out to STAAR@rafmuseum.org

The application deadline is Friday 29 March, any applications submitted after this date will not be considered. This programme is popular so ensure to give the application form your best shot.

As anticipation builds, the RAF Museum Midlands eagerly awaits the opportunity to guide a new cohort of students through the exhilarating world of aviation during the STAAR programme in 2024. This initiative stands as a testament to the museum's commitment to fostering a love for STEM education and inspiring the aerospace pioneers of tomorrow.

The STAAR Programme is brought to you by Northrop Grumman and in partnership with the RAF Museum, Royal Air Force Cosford and TA Education.

Links

Register:

www.rafmuseum.org.uk/midlands/schools-and-colleges/staar/

INSPIRED BY INDUSTRY

'Inspired by Industry' is a set of design contexts for KS3 to address the ever-changing needs of the Design and Technology curriculum. Rather than take a 'project-driven approach to designing and making, they each start with a real-world design context provided by an industry partner of the Design and Technology Association. Log in on the D&T Association website or join to access the additional member-only units which can also be accessed via the website. Visit: www.inspiredbyindustry.org.uk or scan the QR code below for more.

Explore our first nine contexts:

- **The Future of Recipe Boxes (Mindful Chef)**
- **Promotional Displays (Dinosuit)**
- **Toys to Teach (Yoto)**
- **Making Music Inclusive (Salsus Design)**
- **Accessible Controllers (Scalextric)**
- **Robots to Improve the Quality of Life (PTC Onshape)**
- **Wearable Technology (Thrive Wearables)**
- **Supporting New Mothers (Elvie)**
- **Making Life Easier for Parents (Mamas & Papas)**

Further contexts to be released. Keep an eye out for announcements.

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studydesign@aub.ac.uk
www.aub.ac.uk

Design opportunities

Jump into competitions to stretch your limits and have some fun! Taking part not only lets you challenge yourself but also brings a bunch of benefits. Check out awesome design competitions and opportunities below.

V&A Innovate Challenge

V&A Innovate is an annual National Schools Challenge, asking students in Years 7, 8 and 9 to work in teams to design a solution to a real-world problem. V&A Innovate is based on design thinking and human-centred design methodologies.

https://www.vam.ac.uk/info/va-innovate-challenge-resources#slide-show=84355020&slide=0

Vex Robotics

VEX Robotics is educational robotics for everyone. Beyond science and engineering principles, VEX encourages creativity, teamwork, leadership, and problem-solving among groups. It allows educators of all types to engage and inspire the STEM problem solvers of tomorrow.

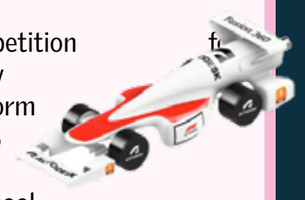
www.vexrobotics.com

Biomimicry Institute's Youth Design Challenge

The Biomimicry Institute's Youth Design Challenge is a project-based learning experience that asks middle and high school teams to design bio-inspired ideas that can provide solutions to critical real-world problems.

youthchallenge.biomimicry.org

F1 in Schools



F1 in Schools is a competition primary and secondary students where they form a team of between 3-6 to design and race a miniature F1 car. A school is allowed to enter a maximum of five teams in the secondary competition.

www.f1inschools.co.uk

Airgineers

Airgineers is a range of STEAM products that give secondary school students the chance to design, build and learn to fly a radio-controlled quadcopter. Students can fly their micro-drones in team games, individual challenges, and time trials.

www.airgineers.co.uk

Design Ventura

Students are challenged to design a new product for the Design Museum Shop with the winning product manufactured and sold at the shop. The programme is supported by free workshops, teacher CPD and visits to the Design Museum.

ventura.designmuseum.org

Scalextric4Schools

The competition aims to inspire young students to consider design and engineering in higher education and as careers. Over 500 schools participate annually, many incorporating the competition into curriculums. PTC sponsors the challenge.

https://www.scalextric-4schools.com/

Make:able

This competition offers a chance to make a 3D printed product or prototype that improves the day-to-day life of the elderly or someone with a disability. This then gets presented in a video submission for the chance to win prizes.

www.makeablechallenge.com

Earth Prize

The Earth Prize is an annual, global sustainability competition for students between the ages of 13 and 19, which rewards the team whose projects have the most potential to address and solve environmental issues.

www.theearthprize.org

Teen Tech

The TeenTech Awards are for students aged 11 to 16 and 17 to 19 and entrants can work individually or in a team of up to three. This offers the opportunity to develop potential and showcase qualities that are appreciated by both employers and further education.

teentech.com/awards

Furniture makers School Design Prize

In its seventh year this opportunity is open to GCSE and A Level students. Hundreds of sponsored copies of 'Design of the 20thcentury' are sent to schools who are asked to gift it to their top students.

www.furnituremakers.org.uk/education

Green Power

Teams of students aged 9 to 25 from across the globe compete at Greenpower events in the UK and other countries. The annual international final takes place at venues such as the UK's Silverstone National Circuit and Goodwood Motor Circuit.

www.greenpower.co.uk

Big Bang Competition

This competition is free and open to all students aged 11 to 19 studying in the UK. Competitors can only enter one project, either on their own or as part of a team. The Competition will close on 30 March 2023.

www.thebigbang.org.uk/the-big-bang-competition

TDI Challenge

The Manufacturing Technologies Association (MTA) is launching their 2023 edition of their flagship competition for D&T and engineering students, the Technology Design and Innovation (TDI) Challenge. The competition is free to enter, and students can win a range of prizes.

www.thetdichallenge.co.uk

EDT

With a range of projects, experiences and placements available from 7 years old to 17 plus. Industrial Cadets Bronze and Gold (previously Go4Set and EES) working with industry professionals to work to a brief. This can be linked to a BA Crest.

www.etrust.org.uk

Royal Opera House

This design challenge is based upon designing for the stage. It can be undertaken as a stand-alone enrichment project to build a student's portfolio and provides students with skills in research, concept development, and designing to a brief.

www.roh.org.uk/schools/resource/design-challenge

Samsung Solve for Tomorrow

Open to ages 16-25 this competition has been designed to explore how tech can take on some of society's biggest issues. All that's needed is an innovative idea that could make a difference to people and communities most in need.

www.samsung.com/uk/solve-fortomorrow/competition

QE Prize for Engineering – trophy design

Giving young people aged 14-24 the opportunity to test their design skills using the latest 3D-design technology. The winner receives a high-end laptop, replica trophy, and opportunity to see their 3D-printed design presented to the winner of the 2023 Queen Elizabeth Prize for Engineering.

qeprize.org/trophy

James Dyson Award

The James Dyson Award is a chance for budding inventors to make a name for themselves. As well as winning a significant cash prize, they could generate media exposure to kick-start their career, earn the esteem of their peers and gain the confidence to launch their own business.

www.jamesdysonaward.org

Wool4School

Create a unique design made from wool, taking inspiration from the earth's natural elements. From fashion design to architecture, visual arts, and beyond – there's no limits to your area of design.

https://www.wool4school.com/about-competition/

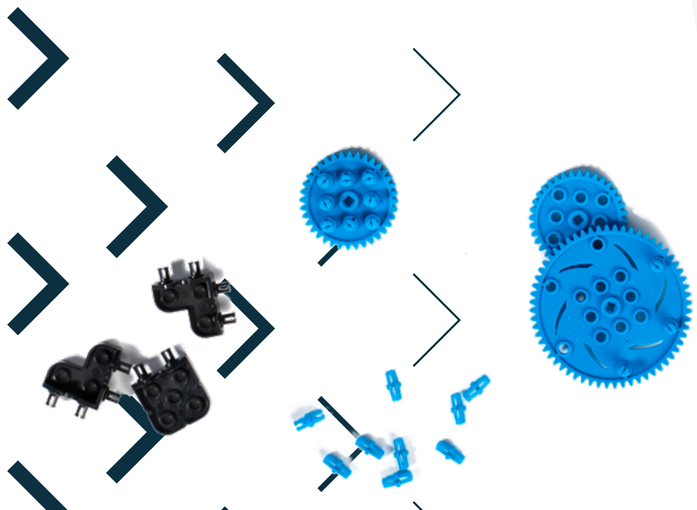
Building Bright Futures through VEX Robotics

Science: VEX Robotics kits are designed to involve principles of physics, mechanics, and engineering. Students can apply concepts such as force, motion, torque, and energy transfer to build and control robots, reinforcing theoretical knowledge.

Technology: VEX Robotics platforms involve programming robots to perform specific tasks. This introduces students to coding and software development, helping them develop foundational programming skills applicable in the technology industry.

Engineering: VEX Robotics kits expose students to fundamental engineering principles, including mechanics, electronics, and control systems. Building and programming robots provide a tangible application of theoretical knowledge.

Mathematics: Designing and programming robots often involves understanding geometric shapes, angles, and distances. VEX Robotics provides a practical application of geometry and trigonometry, making these mathematical concepts more tangible.



DESIGN & TECHNOLOGY ASSOCIATION