

CLEAPSS
Design and
Technology

Future minds

Tomorrow's world explored today

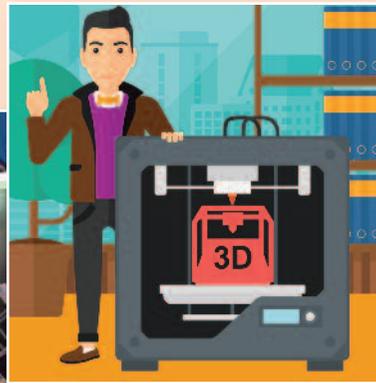


CLEAPSS D&T e-newsletter

Welcome to Futureminds 10.

Its been a busy few months, lots of D&T audits and training, and attendance at various conferences and exhibitions, including Learning Through Technology, the ASE Annual Meeting, and BETT. But, the biggest job has been putting together the Futureminds Live event for June 22nd 2019.

This is going to be a significant change to way we support D&T and Art. CLEAPSS has never hosted such an event.



We have **two** internationally renowned keynote speakers and loads of practical workshops, including:

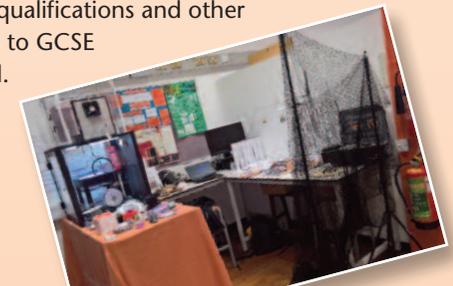
- 3D printing – designing and making items for projects, from KS3 to A Level, with advice on what to buy and how best to incorporate 3D models into school projects.
- Drone flying – have a go at flying a drone indoors, with expert help and guidance, and advice on equipment, safety and how drone making and flying can enhance the curriculum.
- CAD/CAM – get hands-on experience of a range of high quality machines and software, with advice on how to use and maintain equipment, as well as ideas for incorporating CAD/CAM into your curriculum.
- Food Science – take a look at how science and food come together to create high quality outcomes that can be part of your GCSE work.



- F1 in schools – see the cars blast down the tracks and learn how to engage pupils in various national competitions based around designing and making high quality models.



- Arduino projects – work with Arduino boards to develop interactive control systems for projects at all levels.
- Clean air solutions – find out about the latest fume and dust extraction systems for controlling emissions from equipment such as 3D printers.
- Vocational qualifications – explore the future of vocational qualifications and other alternatives to GCSE and A Level.



There will also be loads of suppliers showing off their latest equipment and ideas for supporting the development of D&T and Art in schools.

Futureminds LIVE

Futureminds Live will be held at
the Fielder Centre in Hatfield,
Herts, AL10 9TP
on Saturday June 22nd.

Futureminds LIVE

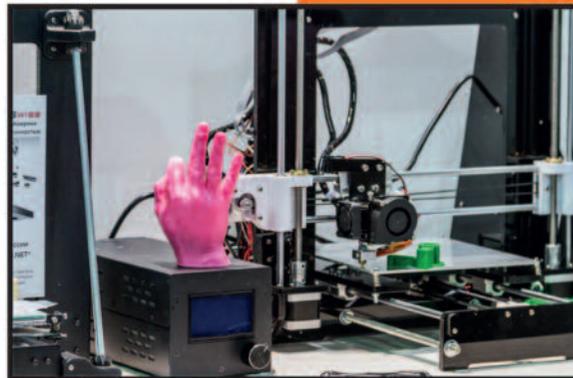
Tomorrow's world explored today

Saturday 22 June
10am-3pm

The Fielder Centre, Hatfield, Herts. AL10 9DP

Re-ignite your
passion for D&T!

Only £80 for a day of hands-on inspiration.



For more information:
www.cleapss.org.uk and go to the CLEAPSS Technology site

 @cleapss_dt

Tickets are available from Eventbrite, delegate tickets cost £80, which includes entry to the event, and the workshops, a good lunch and lots of opportunity to meet other teachers and technicians to discuss what you are doing and how we can help to support you to re-ignite your passion for D&T and Art.

To find out more take a look at the information on the website, follow us on twitter or on Facebook, and make sure you get hold of the summer Futureminds edition, which will include the programme for the event.

Tickets:

FuturemindsLIVE2019 Tickets

[FOLLOW LINK](#)

Facebook:

FuturemindsLIVE Facebook

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Futureminds LIVE

Some of the workshops and exhibitors already confirmed:

Learnbylayers provides a 3D printing curriculum for teachers and students with lessons aimed at a wide range of learners from complete beginners to more advanced users. All lessons are fully editable by the teacher and are focused around learning the principles of 3D printing and designing for 3D printing. There are four levels of the curriculum, beginners, intermediate, advanced and expert lessons that are mapped against national standards. Learnbylayers is currently taught in schools in 23 countries.

STEM Learning is the UK's largest provider of education and careers support in science, technology, engineering and mathematics (STEM).

We offer:

Bursary-funded training for design and technology teachers and technicians

Local CPD support, via your Science Learning Partnership

Free resources for design and technology and STEM

Free STEM Ambassadors programme, connecting STEM employers and university departments with schools and colleges.

Free resources for STEM Clubs

Celtic Kilncare Ltd originated in 1974 in Newport, South Wales.

Our core business is the supply, installation, service and/or maintenance of electric pottery kilns and equipment used by education authorities, government agencies and studio/hobby potters throughout the UK.

We also undertake health & safety audits of pottery kiln rooms.

We deliver teacher training for the safe use of pottery kilns.

Other specialist services include new-build classroom and equipment feasibility studies, kiln relocation and or disposal and kiln incident investigation reports.

Celtic Kilncare Ltd remains fiercely independent and, with over forty years experience, can supply and or give impartial advice on kilns and equipment from the majority of the current leading manufacturers.

The CREATE Education Project brings together game changing technology with inspirational content and creative minds. This collaborative platform is designed to provide FREE resources and support to help educators to introduce and embed 3D printing technology in the classroom. These include professional development resources, lesson resources, project ideas and inspiration. Contributors and community members are provided with a network of people embracing the same passion for sharing and improving access to education.

In order to ensure everybody has the opportunity to benefit from 3D printing and other exciting tech, we reached out and asked educators and industry leaders what the challenges were and how can we make the best of the opportunities. We aligned these with our core values and CREATE Education Project was the result.

British Nutrition Foundation: Food – a fact of life (FFL) is a comprehensive, progressive education programme which communicates up-to-date, evidence-based, consistent and accurate messages around 'food' to all those involved in education. FFL is managed by the British Nutrition Foundation (BNF), in partnership with the Agriculture & Horticulture Development Board (AHDB).

Futureminds LIVE

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Some **more** of the workshops and exhibitors already confirmed:

TechSoft UK Ltd supply the latest CAD/CAM systems. TechSoft's own software, 2D Design, 2D Primary and 2D PCB, provides solutions for computer-aided design at all levels of education and beyond. Linked with this, TechSoft also provide a comprehensive range of computer-aided manufacturing solutions, from knife cutters and laser cutters to 3D printers; CNC embroidery to advanced milling machines. In addition, TechSoft design and deliver complete solutions for new or refurbished departments, providing a full range of equipment from textiles resources to manual workshop machinery, including bandsaws, circular saws, etc.

The Food Teachers Centre (FTC) is a UK-based self-help group for secondary teachers. It provides a platform to exchange best practice and support to less experienced teachers answering practical concerns and keeping them abreast of the latest curriculum changes.

CLEAPSS will be holding a make-it session, using Arduino and other control systems to make technical solutions to real problems.

The Textiles Skills Academy was founded in January 2015 by Dawn Foxall to bring together experienced education presenters and industry experts to deliver relevant events, industrial visits, seminars and practical workshops for Art, Textiles and D&T teachers, to aid the delivery of the curriculum and to raise awareness of the recruitment issues of the industry.

Skill Supply deliver hands-on, engaging STEM workshops using a range of high tech and no-tech approaches. As the UK's leading users of drones in education we have worked safely with over 3400 learners. Using drones we deliver sessions focussing on engineering, computing, geography, maths, interview skills and the rule of law. Our learners range in age from primary (Year2) through to Year 13 and beyond into the boardroom, developing a range of transferrable skills. Our work is linked to the curriculum, Ofsted outcomes and Gatsby benchmarks.

HPC Laser is one of the UK's leading suppliers of CO2 laser cutting and engraving machines. Established in 2006, our team of skilled engineers have delivered, installed, serviced and supported over 4500 Laserscript machines across the UK, primarily into education.

Our clever modular design allows our larger machines to be part-disassembled to fit through a single doorway.

All our PRO machines are covered by an ONSITE warranty with options are available to extend up to 3 years.

Our customers benefit from free of charge lifetime technical support and onsite engineer support is available throughout in the UK.

BOFA is a world leader in portable fume and dust extraction technology. Our product portfolio covers a wide range of markets, including laser, electronics, dental, printing, 3D printing and additive manufacturing, bringing affordable best in class products into the working environment. Our extensive knowledge, in-depth experience, and outstanding expertise means we add value to our customers who trust and adopt solutions we develop. We're proud to have won a Queen's Award for Innovation.

3D printing guidance

As readers will have been aware, over the past few years we have been working with HSE to develop guidance on the safe use of 3D printers in schools and colleges.

This work has included a whole range of tests and experiments, carried out at the HSE laboratory in Buxton.

The tests covered two areas:

- Characterisation of the particulate emissions
- Volatile organic compound (VOC) emissions

Pyrolysis testing was used to find out what the filaments produced when heated. We tested a number of different filaments including:

- PolyLactic acid (PLA)
- Acrylonitrile-Butadiene Styrene (ABS)
- High Impact Polystyrene (HIPS)
- Nylon
- Embedded Metals
- Wood
- Ceramic
- Carbon Nanotubes

During this test a small sample of the filament was heated to the temperatures used in printing and a gas chromatograph with mass spectrometry was used to determine the chemical emissions.

The size and quantity of emitted particles was also measured and it was seen that as the temperature increased the number of particles increased, and the size of the particles reduced.

The risk to health is increased as particle size decreases, because the particles can enter further into the breathing system, and potentially transfer across the air/blood surfaces of the lungs.

It became apparent that, in use, all filaments give off chemicals and particulates. Under COSHH regulations, any harmful emissions must be risk assessed and, where necessary, controlled. There are

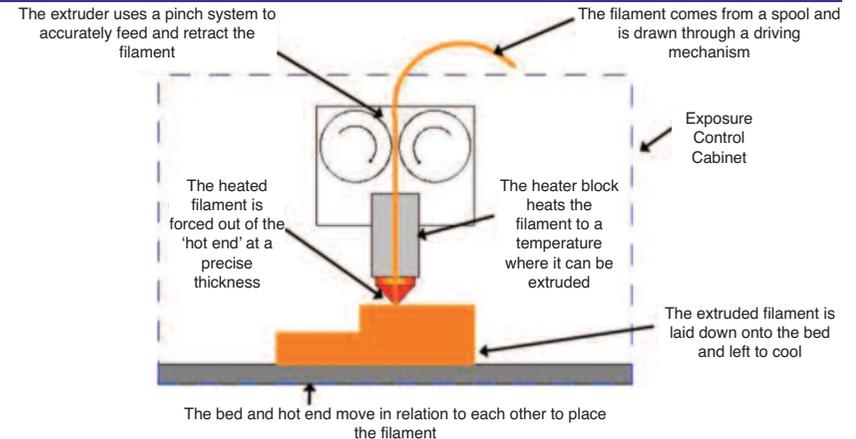


Diagram of a Fused Filament 3D printer inside an exposure control cabinet

currently no work exposure limits (WELs) for the emissions from fused filament fabrication (FFF) 3D printing so to achieve effective control of emissions we need to apply the general principles of good practice for the control of exposure to any volatile substance hazardous to health.

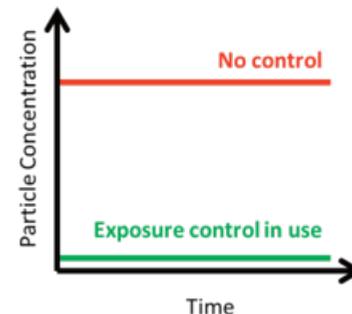
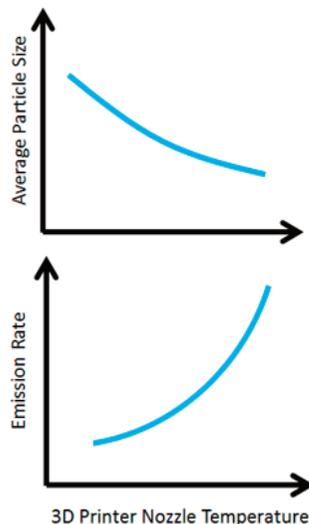
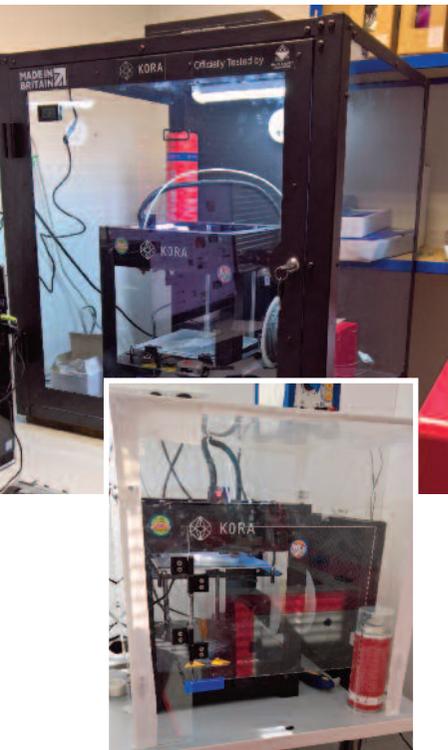
For some individuals, brief exposure to these emissions may trigger symptoms but there may also be longer-term health risks for individuals who spend long periods using 3D printers. This is why the guidance is to have some sort of ventilation and/or extraction in place where 3D printers are used.

At CLEAPSS, we have installed our printer within an extracted enclosure, which draws the air through the cabinet and expels it via a HEPA and a carbon filter. The filters remove both harmful chemicals and trap particulates, so the air itself can be re-circulated into the room.

Placing the machine in such a cabinet also overcomes the other hazards associated with 3D printers: trapping and burns from moving hot components.

For more information see the guide on the website: **3D Printing In Schools and Colleges: Managing the Risks**

Search for 3D on the CLEAPSS D&T site.



Respiratory Protective Equipment – RPE

We have recently published new guidance on the use of RPE:

GL310 A guide to the use of Respiratory Protective Equipment (RPE) in school D&T and science

Search for RPE on the CLEAPSS D&T site

This document pulls together information and guidance from a number of sources, to provide clear guidance for staff in D&T and science.



Apart from a small number of explicit occasions, **we do not recommend** that face masks are worn as RPE.

If a process or activity is likely to produce sufficient quantity of dust or fumes that require a user to wear some sort of face mask, **we recommend** that the activity is altered. This could be to avoid the generation of hazardous products, or to extract these products such as by using local exhaust ventilation (LEV). Where hand-sanding or use of orbital sanders may create a lot of airborne dust, we recommend the use of LEV, such as an airbench, or other system that draws the dust away from the user.

On the very few occasions where the use of a face mask cannot be avoided, such as emptying the LEV dust collection unit, **we recommend** that the operative wears a mask to FFP3 standard as minimum protection. Under COSHH regulations, the RPE must be 'suitable', which means it must fit closely. To ensure that it fits properly the users must be trained in why and how to use RPE of any sort, including disposable masks,

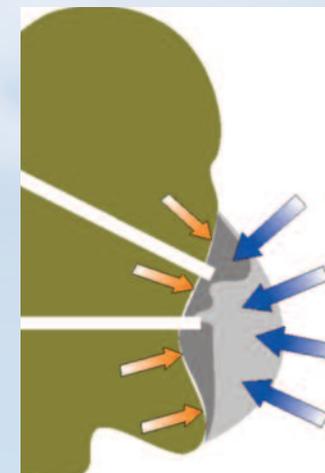
half mask respirators and full mask respirators. The HSE recommends that users should be face fit trained by a competent person. http://fit2fit.org/?page_id=4

The face fit testing of pupils is impractical, as most would fail. Dust masks are designed for adult use, so would tend to be too large to fit a pupil properly.

For those of us with facial hair, we will find it very difficult to pass a face fitting test. The solution is a loose-fitting hood, such as those made by 3M or Trend fitted with P3 filters. These hoods have a full-face shield and a textile collar that makes a loose seal around the face. The hood is fed clean air via a filter unit. The wearing of these does not require the user to be face fitted.

Where fumes are the potential hazard, **we do not recommend** the wearing of RPE, which could absorb and contain fumes. Any activity in schools that could create a significant risk of fumes should only be carried out in a suitably ventilated area, such as a fume cabinet, or

where extraction is provided to draw the fumes away from the user and others, such as within a laser cutter.



FOOD TEACHERS CONFERENCE

In November 2018, CLEAPSS was invited to have a stand at the Food Teachers Conference in West London.

This was a really interesting day. Around 150 food teachers attended, and took part in various workshops and talks.

CLEAPSS had a stand, where we gave out advice, materials and CLEAPSS mugs.

The interesting keynote talk was given by Ross Morrison McGill, the author of Teacher Toolkit. His theme was why mark work. He explained that research showed feedback is an essential element of teaching, but that regimented marking gives little benefit to pupils, or staff. His talk involved a lot of live engagement with the audience, with graphs and charts indicating the delegate responses to his questioning. A thoroughly enjoyable talk, with lots for the teachers to think about when they get back to school. Ross manages a website with lots of interesting information: <https://www.teachertoolkit.co.uk/>

The whole event was streamed live on Facebook, and there were over 400 people watching the event, as it happened. The event was sponsored by Tunnocks, the manufacturers of Tea Cakes and Wafer biscuits, and each delegate took away some samples and other free gifts. Tunnocks also supports a challenge for food teaching – to elevate the tea cake to a fine dining dessert. There are some interesting responses on the Food Teacher Centre Facebook pages: https://www.facebook.com/groups/foodteacherscentre/search/?query=tea%20cake&epa=SEARCH_BOX

Louise and her team had put together a very engaging and interesting day, with lots of practical activities and a good lunch.



How to Have a Good Emergency,

also known as, Why We Pay our CLEAPSS Subscription!

The name of the author and their school have been deliberately withheld.



The morning of the first day back after the Christmas break, I get a knock on the prep room door from a distressed art technician. *"I think I've got a leak, would you have a look please?"*

It was clear right away that it was a solvent leak and the smell was very strong.

A quick evacuation, opening windows on the way out was followed by a call to CLEAPSS.

I was put through to an adviser and we worked swiftly through the issues.

We weren't sure what the solvent was due to some sketchy labelling, made worse by not being able to get right in and inspect the bottles to see what was leaking.

Calmly the adviser determined that I must phone the fire brigade and, at least, call 111 for advice for the technician that had been exposed to the chemical.

A quick check with the head teacher and I was calling the fire brigade while our school nurse dealt with our casualty.

The Fire Brigade were amazing and arrived within minutes, followed by a team of chemical specialist firemen. They took the lead in all aspects, including assessing our technician and liaising with the hospital. A request from the hospital had the Fire Brigade identifying the chemical on site and our technician was able to go home shortly afterwards (the fireman even dropped her home)

After the Fire Brigade had finished and were being supplied with tea and biscuits I contacted a chemical disposal company from the CLEAPSS list who immediately came and packaged the chemical, along with the others from the art dept, including the cabinet they were in. He made arrangements to come back and collect the items.



How to Have a Good Emergency,

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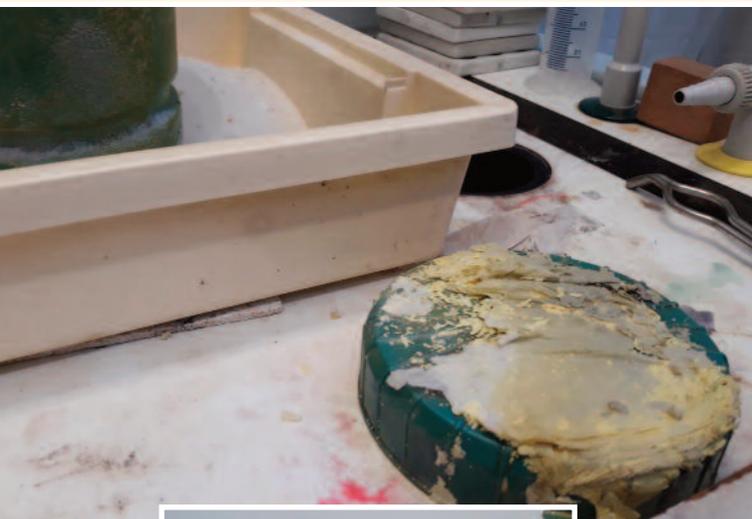
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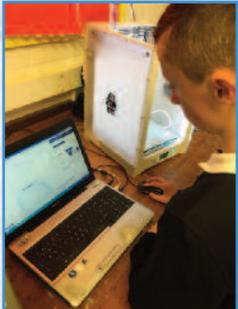
Coincidentally we were ready to do a routine disposal from the chemistry and D&T depts. (Our D&T dept staff are fully hazard-aware and have some good systems in place.) Fortunately the disposal company were able to include everything we want to dispose of, and were in a position to meet the time-sensitive demands of the spill and our routine job. So far, an amazing service from them.

So I consider myself very fortunate to have been supported by such efficient and competent people, firstly CLEAPSS – that vital service that keeps not just the technicians safe and sane, but the wider school and community. I am often heard to say that I wouldn't work in a school that didn't subscribe to their essential service. Essex Fire brigade that swiftly dealt with the issues, and our chemical disposal company who acted so swiftly to accommodate our requirements.

We have learned much from this and, going forward, I have asked to be aware of stored chemicals in the art and D&T depts. They can be added to my stock system and preferably stored in my ventilated flammable cabinet within my chem store. The good practices that are commonly used in the science dept will be shared with the art dept. These are the things that CLEAPSS push for, and simple things that a good science technician does without thinking twice. I have always circulated the CLEAPSS bulletin to these depts, and I think we will all be reading it keenly in future!



There is no doubt that additive manufacturing (industrial 3D printing) is becoming more and more mainstream, with the technology permeating into a wide spectrum of industries including engineering, manufacturing, medicine, architecture, product design and even the food industry.



The rise in adoption of this technology also brings a rise in the number of career opportunities for young people, with many new job types that didn't exist just a few years ago. New job types are being created all the time as additive manufacturing develops and combines with other Industry 4.0 technologies. Consequently, many organisations are reporting

increasing problems in recruiting young people with the skills that they need. In fact education and skills is cited in the top 4 issues facing the industry by the UK Additive Manufacturing National Strategy Group.

Unfortunately, there is currently no requirement for schools to develop any of the knowledge and skills required by industry to prepare them for future careers in additive manufacturing. As the curriculum, GCSE's and A-Levels have all been recently updated, it is unlikely that these requirements will be addressed anytime soon.



DEVELOPING KNOWLEDGE AND SKILLS FOR CAREERS IN ENGINEERING, ADDITIVE MANUFACTURING AND A RANGE OF OTHER INDUSTRIES.



However it is promising that many schools are actively adopting 3D printing technology. 3D printing provides Design & Technology departments with a number of benefits, including the use of the technology as a rapid prototyping tool, allowing students to quickly produce multiple iterations of a product or part.

But most of all, access and experience in the technology provides students with the opportunity to get ahead and prepares them to take advantage of the jobs and careers available to them.

The introduction of the new statutory guidance from the DfE around offering career guidance linked to the Gatsby Benchmarks a further opportunity to forward thinking departments for linking their Design & Technology curriculum to careers in Additive Manufacturing (Gatsby Benchmark 4). They can achieve this by providing students with the opportunity to develop the knowledge and skills required by the industry, alongside their standard curriculum delivery. To help with this the CREATE Education Project has worked with industry

By Sonya Horton,
www.createeducation.com



partners to develop a 3D Printing Knowledge and Skills Progression Framework. The framework consists of the following three strands:

- Additive Manufacturing & 3D Printing Processes
- Designing for 3D Printing and Slicing Models
- 3D Modelling

Within these three strands, the knowledge and skills have been organised into three levels (Foundation, Intermediate and Advanced) to allow for structure and progression.

For each level and strand a series of discrete knowledge and skills have been listed, these can be used to inform planning of schemes of work and discrete lessons, devising assessment opportunities and for embedding into existing or new curriculum and assessment frameworks.

You can learn more and download the knowledge and skills progression document from the CREATE Education Project at www.createeducation.com/resource/knowledge-skills-progression. You can also access lots more free resources, learn more about CPD opportunities and borrow a 3D printer for a month, for free, to run a project in your school.



Dave's Allotment

Over the past year, the D&T and Art adviser, Dave, has been developing an allotment, partly for the relaxation of communing with nature, but also as a way of investigating how much produce could be harvested from a small plot of land, the sort of area most schools could find in their grounds.

Each edition of Futureminds will have a short update of the progress of Dave's plot, hopefully to support schools in developing areas where you could grow foodstuffs for use in lessons, or just for fun.

You could even follow the progress on Instagram: [@parrys_plot](https://www.instagram.com/parrys_plot)

As a head of D&T, Dave worked on a couple of similar projects with his department. His department had access to a greenhouse, where the pupils and staff grew tomatoes and other vegetables for use in food teaching, and there were some occasions where areas of the grounds were used to grow some simple crops. The SENCO, who was a science teacher, also ran a 'compost club' which used kitchen scraps to build compost heaps that could be studied by the science department, when they were looking at different ecological activities.



Dave's plot is approximately 4m x 20m, around 80m².

He took it over in September 2017 as an overgrown plot that hadn't been looked after for a few years, so the first job was to clear the ground. This took a couple of weeks of hard digging, but help was available from a couple of friends and family.



When it was cleared, it revealed a few plants that were worth keeping:

- Asparagus – this is tricky to grow to start with, so finding a well-established asparagus bed was a great start.
- Various soft fruits, including strawberries, loganberries, blackberries, raspberries, and gooseberries.
- Rhubarb, a crown of rhubarb looks quite rough and unpleasant, but when the stems start to emerge it quickly becomes an enormous presence, with lovely bright red stems and deep green leaves.

Once the ground was cleared, it could be divided up into manageable plots, each could then be used to grow vegetables, allowing for future rotation of crops.



Dave's Allotment ...continued from page 12



Each plot was edged with decking boards and the paths were laid out, but this meant that the paths soon became muddy, a solution was found later in the year when a neighbour decided to remove a pea-shingle drive, and the unwanted pea-shingle was laid on the paths to provide a better surface.

Of course a shed was also needed. Fortunately a friend had an old shed he was willing to donate to the allotment, and, with some paving stones laid as a base, the shed was soon raised and used for storage, and hiding from inclement weather.

There were also water butts and compost bins needed, but these had to be purchased.



The first planting started in October, with a range of red and white onions. These were purchased as 'sets' meaning they resembled small onions, rather than seeds. They were planted in one of the, now-weeded, beds and within a couple of weeks had started to sprout thin green leaves.

If you want to start developing a growing area in your school grounds, start with finding a suitable area; sunny, raised for good drainage, with some shade if possible. Seek permission from the senior management and get going:

You will need some tools, a spade and fork at least, its also



useful to have gardening gloves. Anyone working on the plot needs to be aware of the need to wash afterwards, and perhaps have a change of clothes or footwear.

The first task is to clear the surface, bearing in mind that roots can go very deep, so cut or pull the longer weeds, then dig the area, going down at least one spade depth, turn the soil over and leave it alone for a week or two. The weather and wildlife will kill off weed roots and start to break down the soil.

While the soil is being prepared, there are tasks such as planting seeds in small containers indoors, so that they can get a start in the warm, controlled conditions, before being transferred to

the plot. You could even build a 'speed breeding cabinet' described in the following article.

In the next Futureminds Dave will describe the thrill of growing your own produce.

For further inspiration there is a Tedtalk that shows how pupils (and teachers) lives can be transformed by growing their own produce:

https://www.ted.com/talks/stephen_ritz_a_teacher_growing_green_in_the_south_bronx



SPEED BREEDING

As readers will be aware, there is a worldwide problem with food production. There are often articles on the news or in the papers about a potential shortage of this, or a problem with the production of that.

Towards the end of 2018 a news item on the BBC local bulletin reported on a desktop-sized cabinet that had been developed in East Anglia to grow plants at 5 times the normal rate. Following this up, Dave got in touch with the John Innes Centre (JIC) where the cabinet had been made and was being used, and arranged to go and see it in action.



The team developing the cabinet are academics working at the JIC. They showed Dave how it works and what changes are in place for the next version.

The main crop being grown in the cabinet is wheat, but other plants also show rapid growth including, brassicas, peas and chickpeas.

The project is designed to enable scientists to track genetic improvements such as yield, disease resistance, and climate resistance. As the crops grow from seed to seed in two months, six generations of a plant can be observed and tested in one year, whereas normally there would be only one, or possibly two generations.



The cabinet is an enclosed design, using full spectrum, including ultra violet and infra-red, LED lighting. The heat from the lights keeps the interior space at 20°C and the atmosphere is monitored using Arduino data logging.

The data is managed automatically, but can be over ridden via a user interface, so that cooling can be turned on or off, plants can be watered or lights can be dimmed. The lights are usually kept on for 22 hours and off for 2 hours each day, allowing the growing cycle of the plants to ease off for a couple of hours.

The cabinet is an open source design, with plans available from: <https://github.com/PhenoTIPI/SpeedSeed3/wiki>



We, at CLEAPSS, will be working on a version for schools. A D&T project to make an innovative device with a real purpose, and for the science department to use in plant investigations.

Although the premise of the project was to investigate speed breeding of wheat and other food crops, we can already see other benefits. These include bringing on seedlings, so that they become strong plants in a shorter period of time, prior to planting out, as a small crop for a garden (or allotment – see previous article) and for observing plant growth in biology. With much shorter growth periods, pupils can see results more rapidly, and, over time, can investigate variables such as, heating, lighting and watering levels.

Link: <https://www.jic.ac.uk/press-release/space-inspired-speed-breeding-for-crop-improvement/>



'CHEFS BACK TO SCHOOL'

by Barbara Rathmill of the Food Teachers Centre

The Food Teacher's Centre Chefs Back to School programme was piloted with Westminster Kingsway College and University of West London in 2018. Student chefs returned to their original secondary school. They provided a practical demonstration to an examination class and described their own course and future career prospects to pupils at the school.

The project plans to:

- Utilise an estimated 20,000 (17-19-year-old) hospitality and catering students to go back to 1,000 secondary schools and reach at least **25,000 pupils by 2022**, starting with 200 schools in 2018-19.
- On their visit, student chefs will meet pupils, teaching staff and headteachers, **increasing the visibility of this valuable subject**, creating a talking point and photo opportunity in school of a successful ex-student.

The project objectives are to:

- upskill the student chefs to confidently demonstrate their culinary skills in order to **enthuse other young people** about Hospitality & Catering courses, and the benefits of a career within the food industry. After the school visit, student chefs will be able to reflect on how much they have learned on their course which will boost their self-esteem, as well as improve their planning and presentation skills.
- provide secondary school food teachers with first-hand, up-to-date information about local courses and careers, so that they are **better equipped to give accurate careers advice** to pupils and parents during options meetings
- Forge a **sustainable, long term partnership** between local schools and colleges to increase recruitment to local catering and hospitality courses and provide support between them.

We have chosen student chefs rather than tutors to visit schools. Our research shows that it is increasingly difficult for tutors to find the time within their busy schedules to carry out meaningful outreach work. Using student chefs is a more sustainable model, it is easily scalable nationwide and school pupils will be able to identify with student chefs who are closer to their own age group.

We will use the lessons learned from our pilot to extend the scheme over the next three years to all colleges with catering departments. We have developed 'Back to School' guidance for college tutors, student chefs and food teachers at host schools, which includes logistics such as safeguarding, example sessions and careers materials to be

shared. After the pilot, guidance will be reviewed, developed and distributed. By utilising our extensive network of food teachers and database we can confidently co-ordinate the student chef visits back to their old schools. We can offer first call introductions for those colleges that do not have contact with their local schools. We can promote and publicise the scheme with our partner organisations and networks (such as City and Guilds Centres) as well as through our social media channels. Discussions with key colleges show that they are keen to get started.

The Food Teacher's Centre on-line community is now 5,000+ food teachers. The group was founded by experienced food educationalist **Louise T Davies** in 2013 and run by an unpaid volunteer team of 10 associates based around the UK. We provide a platform to exchange best practice, give advice to less experienced teachers, and keep teachers abreast of the latest curriculum changes. To ensure all teachers are included, there is no membership fee.

We were recently recognised as 'one of the most active, engaging and influential groups' on-line and have won awards in 2017 (Global Excellence Award)- **Best Nutritional Health School Engagement programme, and Best Public Health Sugar Reduction Awareness Campaign.**

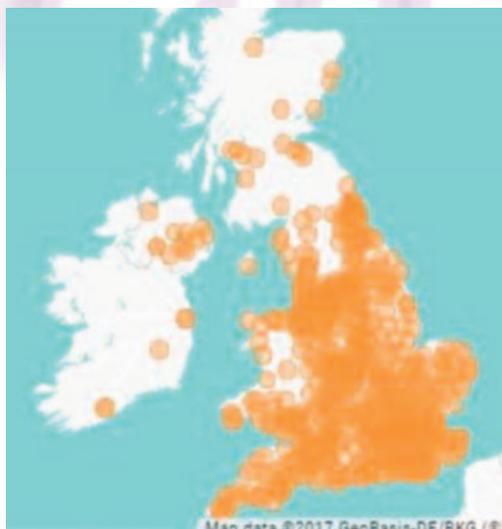
We generate income by training teachers at our own events nationally, reaching 7500 secondary food teachers since 2014. We work collaboratively with all the major policy agencies (United Nations, Ofsted, Department for Education, School Food Plan) and partner with key industry representatives, such as British Nutrition Foundation, Agriculture Horticulture Development Board, Chilled Food Association, Institute of Food Science and Technology, Springboard UK, Royal Academy of Culinary Arts, Taste of Game, Royal Horticultural Society) to promote our aim of 'better food teaching'.

For more details of our projects and events: www.foodteacherscentre.co.uk

The Food Teachers Centre public page:

<https://www.facebook.com/foodteacherscentreuk/>

Contact us: infor@foodteacherscentre.co.uk



Map data ©2017 GeoBasis-DE/BKG (©)

futures by design.

The choices young people make at school can shape and influence their future, the career path they take and the opportunities that are available to them. That's why it's so important that learners are given access to the right support and guidance at schools, to help them as they make these choices.

Good Career Guidance

To ensure that every young person has access to high-quality career guidance, the Gatsby foundation commissioned Sir John Holman to research the actions that schools can take to ensure that all learners have access to high-quality career guidance and develop the 8 Gatsby benchmarks. These 8 Gatsby Benchmarks now form the core framework of the Department for Education's Statutory Careers Guidance which was published in January 2018.

The 8 Good Career Guidance benchmarks

- 1 A stable careers programme
- 2 Learning from career and labour market information
- 3 Addressing the needs of each pupil
- 4 Linking curriculum learning to careers
- 5 Encounters with employers and employees
- 6 Experiences of workplaces
- 7 Encounters with further and higher education
- 8 Personal guidance

How is NCFE helping schools to meet the Gatsby benchmarks?

NCFE is an Awarding Organisation with 170 years' experience in designing, developing and certificating technical qualifications which are delivered by schools.

NCFE has also developed three ways in which V Cert Technical Awards can help schools to demonstrate compliance with their Careers Strategy obligations – particularly the second Gatsby Benchmark, whereby schools must support young people to learn from career and labour market information. These are:

- **factsheets for each V Cert qualification**
- **career cards for each V Cert qualification which include possible careers, progression routes and useful websites**
- **Labour Market Intelligence report.**

We understand the importance of tangible routes into the work place, including allowing learners to undertake short-term work experience, speaking to people in the job and having an idea of what to expect as part of that career path. We interviewed our Graphic Designer, Richard, to find out more about how he got his job and what advice he can offer young learners.



meet the designer.

Richard Hanley, Graphic Designer at NCFE.

When did you start your Graphic Design Journey?

I studied Graphic Design at school and wanted learn more and progress in my career. I decided to go to college and studied a National Diploma (ND) and Higher National Diploma (HND) in Graphic Design.

What did you learn that wasn't taught in a classroom?

I learned that creativity is the key ingredient to Graphic Design and that it's all about the idea. You don't have to be the best artist in the world as it's mostly about conceptual thinking and always seeking the BIG idea.

Be yourself because everyone is different. Have faith in yourself too, you will never be everyone's cup of tea but if you work hard and listen you will always get respect and that goes a long way.

What does a typical day look like for you?

Well, there is no typical day. Most days are different as I work on a variety of projects and all kinds of media. Print design, online materials through to large exhibition spaces. That's why I love my job as no two days are the same and it's hard to get bored.

there is no typical day.

What advice would you give to learners who would like to enter the sector?

Try and get as much work experience as possible. Get yourself out there, meet the professionals who do this as a day job and become a sponge for knowledge. You'll have to work hard and always be up for a challenge. Once you have a foot in one door it opens others, but be prepared to go that extra mile and always aim to impress, if you don't others will.

**futures
by design.**

Support and guidance

[Graphic Design factsheet](#)
[Graphic Design career card](#)

Graphic Design webinar
6 February 2019, 4pm

[Sign up today](#)

Free networking events

Find out more about V Certs and schools delivering them in your local area.

[Find out more](#)

Find out more on our website
ncfe.org.uk/schools

CLEAPSS small print

3D printing

As mentioned in the earlier article, we have produced guidance on the use of 3D printers in schools. This covers FFF type printers, and we are now looking at other types of printer, including liquid polymer machines.

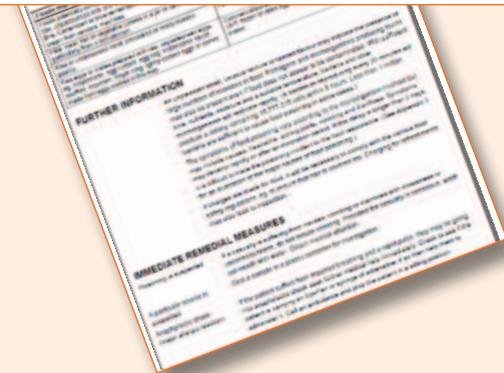
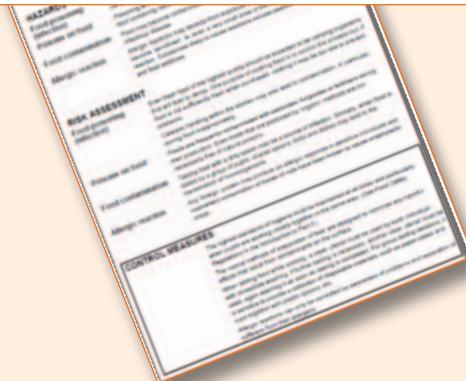
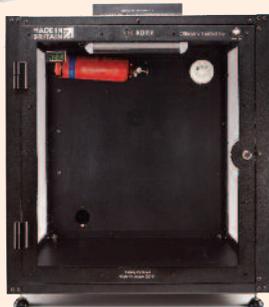
Whichever type of machine you use in school, you must carry out a risk assessment and provide a written copy for your records in school. There is a model risk assessment on the website: **MRAT - 1.088 - Additive Manufacturing: 3D Printing**
Search for 3D on the CLEAPSS D&T site.

New MRATs

We are in the process of updating the MRATs. As you can imagine, this is quite a task, but we are hoping to have some exemplars ready for Futureminds Live in June. The content of most of them will not change very much, but through reviewing them and asking teachers and technicians on our courses, we have developed a new format that brings the control measures to the forefront.

1.071 Related to: COSHH Regs	Wood working: Dust		Applicable to: blockboard; hard wood; MDF; particle boards; plywood; soft wood	See also: L225 1.074 to 1.086
Process(es) covered:		Hand operations do not usually produce large quantities of dust but machine operations often do. Operations such as checking dust control equipment and emptying dust bags are also covered.		
Labelling:				
				
Control Measures:				
<ul style="list-style-type: none"> So far as reasonably practicable, local exhaust ventilation must be provided to control the dust at its source. Eye protection must be worn at all times when using machines If staff may be exposed to high dust levels while checking dust control equipment or emptying dust collection bags, a dust mask to standard FFP1 must be worn. If the task is likely to take more than 15 minutes or if the dust comes largely from MDF, the mask should be to FFP3. Regular cleaning using a dustless method (eg, an industrial vacuum cleaner) is needed to reduce background dust levels and prevent fire. 				
Details of Dust Hazards				
<ul style="list-style-type: none"> The hazards of wood dust are discussed in the HSE Information Sheet WS 30: Toxic Woods. While hardwoods tend to give rise to more effects than softwoods, there is a large variation from one tree to another of the same species. Any person, including a pupil, who suffers from any of the complaints below or suspects they may have been induced, should seek medical advice. 				
Examples of the attributes of certain woods fall into the following categories:				
Strongly allergenic	Box, Mahogany, Iroko, Rosewood, Satinwood, Yew and Teak.			
Biologically active	Larch, Pine, Cedar, Ebony, Sapele, African Mahogany and Poplar. Significant exposure could result in symptoms of rhinitis, asthma, dermatitis or eczema.			
Allergenic	Chipboard, Blockboard and Plywood are manufactured using phenolic and amino resins and the resulting dust may cause allergic reactions in persons who have already been sensitised.			
Carcinogenic	Hardwoods, particularly Oak and Beech, have been blamed for the very rare cancers observed in the furniture and cabinet-making industries. The much shorter exposure times in school workshops make the risks there extremely low.			

Risk Assessment	
Hazards:	
Dust	Wood process dust is hazardous by inhalation. (See over for further details.)
Flammable	Sawdust is flammable.
Risks:	
Dust	Hard-wood and soft-wood dusts have a WEL of 5 mg/m ³ (8 h TWA) ¹ . Wood dust irritates eyes and the respiratory tract. Exposure to wood dusts above the quoted limits can give rise to skin and lung disorders. Individual wood-working machines without extraction equipment have produced levels of 5 to 10 times the WEL during periods of use. Because of this limit, employers have the duty to keep the dust level so far below the limit as reasonably practicable. When considering individual employees' exposure to wood dust, the employer must <u>take into account</u> their exposure from all sources. For example, 30 minutes at the circular saw, 20 minutes at the planer, 10 x 2 minutes observing pupils at the sander and exposure to background levels throughout the day. The risk of cancer is extremely low. In general, extraction will be needed at machine saws of all types, sanding machines and any other type of wood working machine where fine dust is produced, including portable power tools.
Flammable	General dispersion of sawdust should be controlled. The design of dust collection equipment should be such that it does not increase the risk of fire and explosion.
Further information:	
<ul style="list-style-type: none"> Medium density fibreboard (MDF) uses a urea-formaldehyde resin as bonding agent and has been accused of producing hazardous fumes when worked. There is still no evidence that this is true but it does give rise to much fine dust which must be controlled. CLEAPSS document PS33, <i>Medium density fibreboard (MDF)</i>, gives up-to-date information. Note that hand sanding of MDF can produce large amounts of dust, which should be controlled. Waterproof MDF (usually coloured green) presents the same hazards as ordinary MDF: it is treated to absorb less water and is so more suitable for use in kitchens and bathrooms. Some people are allergic to the dust from any sort of timber and special measures may be needed. Some employers prohibit the use of some or all tropical hardwood timber. Iroko dust has particular problems. D&T departments may be offered old iroko science bench worktops following refurbishment of laboratories. The general advice from CLEAPSS is that iroko should not be used but if it is then no hand or machine sanding should be done by pupils and when being cut by machine the operator should wear a face mask to FFP3 whilst cutting is in progress. Teachers should check with their employer for any such restrictions. 	
Local Exhaust Ventilation	
<ul style="list-style-type: none"> CLEAPSS guide L225, <i>Local Exhaust Ventilation in Design and Technology</i>, gives details on the regulations covering LEV, ways of providing it, appropriate tests and sources. 	



Welding Fumes

Welding guidance has been updated. This will be included in the updated MRATs, but if schools are unsure, there is an interactive LEV assessment tool, which although published by an independent organisation, has a link from the HSE website:

<http://www.breathefreely.org.uk/wst/>

The latest guidance from HSE is that employers must provide adequate fume control for all steel welding.

Soldering

We are currently reviewing our guidance on soldering in school. In the past it has been acceptable to use solder containing lead, as the concern about using lead was based on the hazards related to fumes. However, to comply with the latest guidance about using lead in any form, we are suggesting lead-free solder is the only type of solder that should be used in schools and colleges.

The new concerns over the use of lead are the environmental issues associated with its disposal.

If a pupil were to use lead-based solder on components of a circuit board, which they then take home, there may be a breach of the disposal guidance. The use of lead in school would not breach the guidance, but disposal of lead, which is classed as hazardous waste, may then present a problem.

The simple solution is to avoid using lead-based solder. Note too, schools should avoid using solders with colophony-based (resin) fluxes.

Further advice is contained in the MRAT 1.025 Heat Processes, soft soldering fumes and fluxes, available from the website: Search for soldering on the CLEAPSS D&T site.



BREATHE FREELY

BOHS
The Chartered Society for
Workplace Health Protection

Welding Fume Control Selector Tool

This web-tool is designed to complement the information on the Breathe Freely in Manufacturing webpages. It provides guidance on welding fume control for common welding tasks. A panel of experts from industry, consultancies, academia and the HSE formed a working group to create this web-tool in order to inform managers and supervisors of welders about the best welding fume controls available to protect their health.

This web-tool is not a substitute for a full and properly conducted risk assessment and any recommendations should be considered carefully together with the circumstances of the individual job and work location.

The Control and Management sheets that accompany each recommendation may suggest more suitable alternatives in some cases, as well as containing advice regarding proper use and training on any suggested equipment.

Launch the tool

The screenshot shows a webpage for a 'Welding Fume Control Selector Tool'. It features a dark background with a central image of a welder in a protective suit and mask, with bright sparks emanating from the welding point. The text is white and blue, providing information about the tool's purpose and a 'Launch the tool' button.



Technicians job advertising

During the autumn term we had an extra section added to the D&T site, a job advertising page for technician jobs.

This service is for members to use for free, to post adverts for technicians. The person wishing to advertise will need to log in and then complete an online form. The form is then checked by CLEAPSS and the advertisement is then posted on the site. Although only members can post adverts, the advert can be read by non-members as well.

To use this service, go to the site and click on the services tab, then click Technician Jobs and complete the online form.

The screenshot shows the CLEAPSS website interface. At the top, there is a navigation bar with tabs for FutureMinds, Projects, Administration, MRATs, Services, and Search. The main heading reads "Exciting and safe practical work in schools and colleges". Below this, the "Technician Recruitment Service" section is highlighted. It includes a description of the service and a list of terms and conditions. At the bottom, there is a form titled "About You:" with fields for Email, First name, Family name, Telephone No / Ext, and Your Role (a dropdown menu).

The screenshot shows the "Current Technician Vacancies" section of the CLEAPSS website. It features a navigation bar with tabs for FutureMinds, Projects, Administration, MRATs, Services, and Search. The main heading reads "Exciting and safe practical work in schools and colleges". Below this, the "Current Technician Vacancies" section is highlighted. It includes a description of the service and a list of current vacancies. The "Design Technology Technician" vacancy is highlighted in yellow. It includes details such as the salary (£14,668-15,490), location (Soham Village College, Ely, Cambridgeshire), start date (Immediate), and closing date for applications (27 Feb 2019). It also lists other benefits (CPD, induction programme and pension provided), hours (Full time), and main duties (To help maintain the machine room, workshops and Portacabin in an effective, safe and orderly condition; To provide technical support to the Design & Technology Faculty in preparing and machining materials, maintenance of machines and general workshop duties; Carrying out first line servicing of machines and equipment to ensure safety and reliability).

Some recent tweets



Some great activities and speakers lined up for [#futuremindslive](#) 22/06/19 in Hatfield, Herts. find out more and how to get tickets at [#cleapss](#)



At the [#UAV](#) exhibition in London today, finding out about [#drone](#) use. terrapiinn.com/exhibition/the...



[#BETT2019](#) Steve is talking primary science on the [#CLEAPSS](#) stand, come and say hello G82



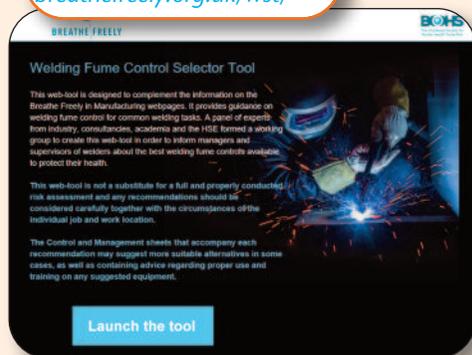
Fire fighting train? Great D&T starter, new technologies and materials, textiles testing, equipment design, real projects in real contexts: bbc.co.uk/iplayer/episod...

The [#3dprinter](#) is working well in it's safety enclosure on the [#CLEAPSS](#) stand g82 at [#Bett2019](#)



Interesting video, describing how others are seeing the same results we have from testing [#3dprinting](#) youtube.com/watch?v=NaK0gp... take a look at the guidance:

If you are [#welding](#) in [#school](#) work through the new welding fume tool to assess the level of extraction you should be using: breathefreely.org.uk/wst/



If you are dealing with dust in school, how are you protecting yourself and others, we are now in possession of a loose fitting battery powered respirator, saves me having to shave!



Excellent morning at Stephen Perse school in Cambridge, handing out prizes to the [#cleapss](#) [#primary](#) competition

[#bbc](#) Click, interesting use of different technologies in fire fighting, great D&T discussion starter. bbc.co.uk/iplayer/episod...

In the next edition of *Futureminds*:
In the summer edition of *Futureminds* you will find all the details for the live event, including a map, full programme and details of workshops and presentations. This edition will be the guide to the show.
We will also have articles from some of the contributors to the live event as well as other exciting information from the world of D&T, Art and STEM/STEAM.

Don't forget you will need the new login and password for the CLEAPSS website to be able to access the materials, you should already have this in school, if you are not sure, ask your science colleagues, if you are having difficulties, contact us 01895 251496, or via the website: www.cleapss.org.uk

You can also follow us on twitter [@CLEAPSS_DT](#)