Leading suppliers for tomorrow's scientists

VITTA

AUTUMN TERM 2024

BACK TO SCHOOL WITH A BANG!

Great products and lesson ideas for Chemistry Week and beyond | p44

WIN BACK THE COST OF YOUR ORDER

†Stock up this September for a chance to WIN BACK the cost of your order | p3

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ALSO INSIDE...

Primrose Kitten, T Levels, Advice, Downloads, Competitions and more!

Win BACK YOUR SEPTEMBER SHOP†

VITTA EDUCATION

Read the latest industry news, competitions, deals & digest from VITTA Education...

WELCOME TO THE AUTUMN TERM EDITION OF VITTA MAGAZINE

Inside this issue:

WHAT'S ON AND WHERE THIS AUTUMN TERM & BEYOND

The Autumn Term is upon us and as we head towards 2025 the VITTA team will be out and about once again to spread more 'science-cheer', so please stop by to say hello or let us know where you'll be heading!

ASE Northern Conference
16 November

New Scientist Live 2024
12-14 October

ASE Annual Conference
9-11 January 2025

Keep up to date... why not sign-up to our monthly newsletter to stay ahead, or see what's on at **vittaeducation.com/events**

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Cover image: Copper sulfate crystals. **Top image:** PASCO Wireless Conductivity Sensor (PS-3210).

BACK TO SCIENCE THIS SEPTEMBER

Welcome, readers, to a new academic school year and the Autumn Term edition of VITTA Magazine! As the leaves turn golden and the air grows crisp, we're excited to bring you a rich collection of articles, lesson plans, and insights to inspire, inform, and fuel you for the months ahead.

In this issue, we're delighted to continue our collaboration with our regular contributors, esteemed organisations, and familiar faces, and to receive their support. We're also thrilled to introduce new contributors and brands, bringing fresh perspectives and innovative ideas.

Joining us this term is Dr Josh Smalley, well known for being a finalist on the 14th season of The Great British Bake Off and a chemical biologist at the University of Leicester. We also shine a spotlight on "I'm a Scientist, Get Me Out of Here," a unique programme that connects students with real scientists in an interactive format.

The coming months are packed with exciting STEM events, including Biology Week, World Space Week, and Chemistry Week. We've curated some hands-on ideas to help you celebrate and ignite curiosity in the next generation of scientists.

With the new government, educational pathways are evolving. In this issue, we take a closer look at OCR support resources and NCFE updates on T Levels and the reshaping of the technical education landscape.

So, as we navigate this Autumn Term together, we hope that VITTA Magazine serves as a valuable resource and a source of inspiration. Thank you for being a part of our vibrant community. Dive into these pages and join us in celebrating the wonders of science and education.

Wendy & Team

Editor & Brand Manager

WIN BACK THE COST OF YOUR ORDER

Stock up on science supplies with VITTA this September and you will automatically be in with the chance to **WIN BACK** the cost of your entire order†, plus two lucky runner-ups will each receive a £25 VITTA Voucher to spend on more supplies!

This competition is open to everyone and applies to all orders received during September. Get your orders in any way you can before midnight on 30th September, use the phone, shop online, or grab a carrier pigeon! Good Luck!

PLUS, KEEP SAVING THROUGHOUT THE TERM WITH OUR SCIENCE SAVERS...

Need more test tubes or maybe it's time to upgrade your microscopes, VITTA's Science Savers are a great way to save your budget on this term's much-needed equipment and consumables.

See page 49 for further details.

†Payment returned in account credit.
Ends 23:59 30/09/24. See website for full details.

AFFORDABLE EXCELLENCE: THE DURALAB REVOLUTION

Meet the new range of industry-standard equipment suitable for all budgets

DuraLab is revolutionising the science equipment market with a commitment to delivering high-quality, cost-effective solutions designed specifically for educational institutions. At the heart of its success lies a strategic focus on providing durable and reliable products that meet the demanding conditions of school laboratories.

One of DuraLab's most exciting innovations is the new range of **Multi-Use Laboratory Trolleys**. Perfect for a variety of settings—whether in research, medical, industrial, or educational labs—these trolleys are crafted from a blend of nylon fibre and recycled polypropylene (PP). This unique combination not only ensures exceptional durability but also underscores DuraLab's commitment to sustainability. With an ergonomic design, precision-bearing rubber castors, and easy assembly, these trolleys reflect DuraLab's dedication to providing practical, cost-effective solutions for schools.

Another stand-out product is the **DuraLab DF-100 Classic Monocular Microscope**. Esteemed for its unwavering reliability and straightforward usability, the DF-100 (pictured) is particularly well-suited to teaching environments and laboratory settings, thanks to its economical price tag. Catering adeptly to both new and experienced users, the DF-100 further underscores DuraLab's commitment to educational excellence, coming complete with a generous 5-year warranty that provides long-term peace of mind and support.

Understanding the budget constraints many schools face, DuraLab places a high priority on efficient manufacturing processes and streamlined supply chain management. This approach allows the company to offer competitive pricing without compromising on quality, resulting in significant savings that enable schools to invest in top-notch laboratory equipment.

KIT OUT YOUR LAB WITH DURALAB...

Order any DuraLab product from VITTA Education this September and receive DOUBLE VITTA REWARD POINTS!

DuraLab offers a comprehensive range of science equipment, covering all the essentials needed for a robust educational experience. Whether it's chemistry, biology, physics, or general science labs, the extensive selection simplifies procurement by allowing schools to source all their equipment from a single provider. This ensures consistency in quality and performance across the board.

Ease of use is a hallmark of DuraLab's products. For example, the **C15 Clinical Lab Centrifuge** (left) features an intuitive menu and an easy-to-read display. Its maintenance-free brushless DC motor and electric lid lock enhance practicality, making it a reliable tool for safely and efficiently separating bodily fluids.

Innovation is embedded in DuraLab's philosophy, as evidenced by the **DP-3002 Advanced Precision Balance**. This device combines cutting-edge load cell technology with a user-friendly interface, delivering precise performance for a range of laboratory, industrial, and educational applications.

Beyond offering exceptional products, DuraLab is committed to providing outstanding customer support. The company offers a full suite of services, including product training, technical assistance, and a responsive customer service team, ensuring that schools can use and maintain their equipment effectively.

In summary, DuraLab is setting a new benchmark in science education by merging high-quality, innovative products with competitive pricing.

With versatile and durable solutions like the Multi-Use Laboratory Trolleys, DP-3002 Precision Balance, and C15 Centrifuge, DuraLab is a trusted partner in enhancing science education. Schools can count on DuraLab to deliver the essential tools for a successful science curriculum while staying within budget, making it a valuable ally in advancing educational excellence.

Additional points added automatically. Online orders only. Double points end 30/09/24.

NEW TERM TOP TIPS FOR TECHS

Sharing and caring for technicians with the ASE

We asked some of our technician members what their tips were, heading into the Autumn Term. We hope you find some useful tips and wish you a great start to the new year!

Talk to new staff

Talk to any teachers new to the school and find out what their practical experience/skills are like? Can you offer them any training in things they might not be confident with.

I do a little induction if there are new members of staff explaining how we work as technicians (who we are, where we can be found, requisitions, lab logger) and a bit of health and safety

Talk to any ECT's and plan a mutually convenient, regular time for them to drop into the prep room to look ahead at any practicals coming up.

Plan ahead

Think about upcoming curriculum areas such as individual assignments/investigations and projects, is everything in place to support these? Attend departmental/whole school meetings, be part of the team!

Get to grips with your new timetable so you know when labs are busy (and practical requests are at a peak so you need to be more organised) and also when they are empty so you can ear-mark that time in your weekly plans to perform any lab checks and maintenance.

If your department has a team meeting at the start of the year make sure you attend and ask for a slot to remind everyone about practical ordering protocols and deadlines.

Prep the lab spaces

If no-one has been in all summer, go round the labs and prep-rooms checking that all is as expected. Did contractors turn off the water, gas or electricity and not turn it back on? Have any trolleys, steps or kit gone walkabout? It's good to raise any issues as soon as possible so that they are resolved quickly and your preparations and lessons are not impacted.

Get organised... ensure stock checks have been undertaken and teaching lab spaces are refurbished and ready for teaching colleagues and pupils.

Review the SOW for the first term to make sure you have all the resources required – do you need to order in fresh bacterial cultures or hearts for dissections?

GET AHEAD WITH ASE'S AUTUMN TERM CPD SCHEDULE

Physics: Basics to Brilliance – Online workshops to support your GCSE physics teaching subject knowledge.

ASE SEND programme – Themed workshops for all age phases.

International Science Teachers Network – Themed Sessions to support teachers and trainees from overseas in the UK.

ASE Included Programme – A newly launched programme developed for primary schools.

Primary Insights Network – Networking sessions to explore topics for primary teachers.

Technicians CPD – Series of sessions with subject focus and around leadership skills.

Teacher Developers Network – Termly online networking sessions focused around a topic.

Regional Conferences – Our Northern and West of England conferences take place this autumn.

To book or to find out more about these sessions head online to **ase.org.uk/events**

Invest in your own learning and development

Check out the CPD offerings for the year, so you know what's available and you can get your requests in early. This also helps you to tie-in training requests with any performance management/ appraisal objectives.

Check out the CLEAPSS website and bulletin for any updates or issues you need to be aware of.

Write that all down... Download VITTA's 'New Term Checklist' to help get you ready this September

"I have met so many great people through ASE and enjoy the opportunities to be together especially at conferences..."

ASSOCIATION FOR SCIENCE EDUCATION

ASE ANNUAL CONFERENCE 2025

BOOK ONLINE
ase.org.uk/annual-conference

9-11 January 2025 |
University of Nottingham,
Park Campus, NG7 2RD

Our next annual conference, the UK's largest science education conference, will be held at the University of Nottingham in January, with sessions for all audiences including dedicated days for primary, 11-19, technicians, ECTs and teacher developers, plus our inspiring exhibition and supplier talks across all three days and some great evening socials planned, we've got something for everyone involved in science education!

Full details and early-bird tickets available from September 2024.

If you are interested in finding out more about ASE membership or just want to explore more of the resources, visit **ase.org.uk**

*£25 per year for technician membership. See website for full details.

THINGS TO DO WITH PASCO

#5: PASCO Wireless pH Sensor

Directly supporting key GCSE Chemistry and Biology topics like the properties of acids and bases, neutralisation reactions, and environmental chemistry, the Wireless pH Sensor from PASCO Scientific has become an essential for chemistry, biology, and environmental science departments.

Compatible with various other probes, including ORP, Flat pH, and ISE electrodes, it is adaptable and versatile. Let's explore some hands-on activities that seamlessly integrate into your curriculum and make learning about abstract chemical concepts more tangible and understandable.

1. Explore Acid-Base Titrations

Students can use a pH sensor to perform titrations involving both strong and weak acids with a strong base. During these experiments, they will carefully add a known concentration of titrant to an unknown analyte while monitoring pH changes using the sensor. By pinpointing the equivalence point and identifying buffering regions on the titration curve, students can analyse the data obtained. This data will then be used to calculate the concentration of the unknown acid or base, utilising information such as the volume and concentration of the titrant.

This hands-on approach not only enhances understanding of acid-base reactions but also develops skills in experimental analysis and data interpretation.

2. Investigate the Chemistry of Buffers

Creating and exploring various buffer systems using a pH sensor is an ideal activity to help demonstrate how buffer solutions maintain pH stability and allows students to measure buffer capacity. Students will use a pH sensor to explore and analyse the behaviour of buffer systems in this experiment. They will start by preparing various buffer solutions with different compositions and concentrations. By adding small amounts of acids or bases to these solutions, they will observe and document the resulting changes in pH. Through careful analysis of the collected data, students gain insight into how buffers effectively stabilise pH levels despite external additions of acids or bases. Additionally, they will determine the buffer capacity, which measures the buffer's capability to maintain pH stability.

This experiment aims to deepen understanding of buffer systems and their crucial role in maintaining chemical equilibrium.

3. Studying the pH of Household Chemicals

Deepening the understanding of chemical properties in real-world situations, this investigation sees students explore the relationship between pH and hydronium ion (H_3O+) concentration using a pH sensor and everyday household chemicals.

They will categorise solutions as acidic, basic, or neutral based on their pH readings by testing a variety of household substances, including vinegar, baking soda, lemon juice, and other common items, to measure their pH levels accurately.

Product shown: PASCO Wireless pH Sensor (PS-3204).

By comparing and contrasting these values, students will gain insights into the relative acidity or basicity of different products. Additionally, this investigation will prompt discussions on the practical implications of pH levels in these everyday chemicals, such as their effectiveness in cleaning tasks or their influence on food preservation methods.

4. Monitor pH During Chemical Reactions

Dry ice undergoes sublimation, transforming directly from a solid to a gas. What happens when it is added to water? When introduced to water, an intriguing reaction unfolds.

Using an indicator, observe the acidification of the water and track the pH in real-time using a Wireless pH sensor with SPARKvue. Continuously monitor the pH throughout the reaction and plot these changes over time to uncover any discernible trends or patterns. By analysing the collected data, delve into the kinetics of the reaction and explore factors impacting its rate, such as concentration variations and temperature influences.

...Compatible with various other probes, the pH sensor is both adaptable and versatile...

This approach allows for a comprehensive understanding of the dynamic chemistry at play.

5. Measure pH for Water Quality Studies

In this study, students gather water samples from different sources including tap water, rivers, and lakes. Measure the pH of each sample and then compare these readings with standard pH values for water quality. By doing so, we can understand how various water sources may react differently to challenges affecting ecosystem health. Furthermore, we will explore the implications of these pH measurements on the suitability of water for various purposes, such as drinking water, industrial applications, and supporting aquatic life. This research aims to provide insights into how pH levels influence water quality and its broader environmental impact.

From exploring acid-base titrations to investigating buffer systems and studying pH variations in household chemicals, incorporating the PASCO Wireless pH Sensor brings science to life. Its versatility enables students to explore chemistry-related concepts in real-world applications, making it an invaluable resource for interdisciplinary projects and a unifying force in any education setting.

TOP TIP

Calibrate the sensor before each use using fresh pH buffer solutions. Rinse with distilled water, stabilise readings in buffer solutions, and store appropriately for accuracy and longevity.

Remember...

you can view and record data easily and for FREE using the SPARKvue App on iOS or Android.

GET IT ON Google Play

Download on the App Store

Shop PASCO's Wireless pH Sensor exclusively at **vittaeducation.com** – including PASCO's five-year warranty.

For a look at other wireless sensors and more hands-on activities, including dissolving CO_2 and investigating diffusion, visit **vitttaeducation.com**

BRITISH ESPORTS: LEVELLING THE PLAYING FIELD

Unlike some traditional sports, esports is mixed gender and open to all, regardless of physical ability, offering opportunities to students.

One of the benefits of competitive video gaming is that anyone can get started.

All that's needed is a PC, a game, controller and an internet connection, and away you go.

And unlike football and many other physical sports, esports (aka electronic sports, the act of playing video games competitively to spectators, either online or in-person) is technically mixed gender.

If you have the ability to play well, your age, gender, background and physical ability shouldn't matter. And esports can promote inclusivity, STEM and transferable digital skills. But despite this, in terms of the very best professional gamers, esports is still male-dominant.

GIRLS WHO GAME

In order to level the playing field, there are now collegiate tournaments for women and marginalised genders, providing an environment for females to flourish with like-minded individuals. These competitions are ideal for those studying the Esports BTEC qualifications, first launched by Pearson and national body British Esports in 2020.

British Esports has provided several tournaments via its Women in Esports equity, diversity and inclusivity initiative. Their team has hosted meet-ups, as well as women and marginalised gender tournaments, including the Women in Esports Overwatch 2 Cup for students, and the Valorant Lioness Cup, which goes beyond collegiate esports to focus on higher-tier teams and players of all ages.

Women in Esports aims to encourage mixed gender teams, so the tournaments require three of five players on a team to identify as a female or marginalised gender. This is in order to improve participation and demonstrate how mixed teams in esports should be the norm.

Billie Purdie, Project Development Lead at British Esports, who heads up the Women in Esports initiative, says: "Gaming and esports is a form of escapism for many. There are so many diverse individuals that have found a place and a community for them through this activity, and I am pleased that Women in Esports has helped contribute to that throughout the years.

"My hope, however, is that one day initiatives like Women in Esports won't need to exist. And that all individuals can navigate this industry freely, without worry of feeling marginalised in the same way society presents barriers and challenges."

At the university level, there are also women and non-binary tournaments provided by NUEL and NSE - ideal for those studying an esports degree with British Esports' exclusive university-level partner College of Esports.

BE THE CHANGE SUMMIT

Women in Esports, the equity, diversity and inclusivity initiative of national body British Esports, organises the Be The Change Summit each year.

This in-person event will once again be filled with insightful discussions for 2024, as well as interactive workshops and networking opportunities. It aims to empower individuals, from all industries and areas, to create positive change in their communities.

Limited early bird tickets are on sale for the event, which will take place at City Hall, Sunderland, on Thursday November 21st 2024 from 9.30am to 5pm. VITTA readers can use code **VITTA_EDI2024** to get 10% off!

NO BARRIERS

By engaging in esports within the classroom, students from all backgrounds can develop and learn technological and digital skills that are highly valued in STEM fields, such as game development, software engineering, and data analysis.

Organisations such as Tech She Can and STEM Learning understand how esports is important to get everyone engaged in skills required for the digital age.

For young people with limited access to education, or support networks, esports and gaming can play a vital role.

North Yorkshire Police utilised esports as a tool to encourage those from disadvantaged backgrounds to discover other opportunities and pathways that are available. By bonding over games together, these barriers can be broken.

ACCESSIBILITY ON THE UP

Adapted video game controllers help those with physical and learning disabilities to play video games.

Charities like SpecialEffect assist gamers, specifically young people, to play games with adaptive technologies.

Esports can also provide opportunities for SEN (Special Educational Needs) students for them to compete, make friends and get involved at any level.

British Esports has also spoken about the impact of esports on neurodiverse individuals. Esports has created an inclusive environment that harnesses their strengths, such as attention to detail, strategic thinking and hyper focus. With esports and education, it adds an element of interest to an otherwise regular qualification, allowing students to stay engaged and increase productivity.

British Esports previously teamed up with National Star College and Xbox for a series of esports tournaments, with a showmatch at the annual Student Champs finals. You can hear more from participants in interviews available on YouTube.

There is also more information in these articles: esports is for all and the esports games that are most accessible.

To find out more about Women in Esports, the Student Champs or wider inclusivity projects, scan the QR code. Alternatively to contact us or set up a meeting, please email Billie Purdie at **bp@britishesports.org**

Images: © 2024. British Esports.

I'm a Scientist Get me out of here

Match enrichment to the curriculum with I'm a Scientist, Get me out of here!

"Like a claw in the toy machines in the arcade." That's how climate researcher Leeza Pickering described how she samples the ocean floor to students at Brayton Academy in Selby, North Yorkshire.

The students wanted to know about the challenges of working as a scientist and the places they worked at. Their teacher, Helena Thompson, explained: "We'd recently been doing renewable energy with Year 9 and booked chats for every class. Based on the success of those chats we decided to involve Year 8 who had recently covered climate change in their Science lessons."

I'm a Scientist is a text-based, online enrichment activity that connects students with working people in all areas of STEM. With themes spanning curriculum topics, from Genetics to Renewable Energy, teachers can match student enrichment to their teaching.

The informal, student-led nature of the activity helps students connect with scientists on what feels to be a one-to-one basis. Students ask the questions that matter to them. They get answers from stereotype-smashing scientists, at the level they need. By talking to people with diverse roles and backgrounds, students find common ground and see scientists as real people, just like them.

The impact at Brayton Academy was clear. "Most classes were really engaged with it and enjoyed the opportunity to speak to scientists," Helena reported. Students connected with scientists whose work addresses real-life issues and asked how they could help, too. This kind of interaction supports students' science capital - their personal relationship with science, and how they view the subject. "We felt that it would be great to give other year groups the opportunity," she added.

Getting involved in I'm a Scientist is simple and free for state-maintained schools. Teachers can choose any theme, any time, to match what they're teaching right now. They can return throughout the year with different classes and subjects, like Helena, who's already planning more chats with her Year 8s.

MATCHING ENRICHMENT TO THE CURRICULUM

Over 120 themes are on offer, making for curriculum-relevant enrichment that builds on students' classroom learning. While your KS3 classes study photosynthesis, they could connect with biologists, botanists, and biochemists to get a deeper insight into the process. Maybe during Chemistry Week, your KS4 class could talk to environmental chemists or materials scientists to discover less familiar career paths.

Keep students engaged with special events in the STEM calendar, like:

Earth Day: celebrate with themed activities in environment, renewable energy, ecosystems, sustainability, and more

National Apprenticeship Week: show students diverse routes into careers

World Space Week: connect with astrophysicists with space and physics themes.

fully funded for UK schools*

Actively engages 89% of students

A WHOLE-YEAR GROUP SUCCESS STORY

Encouraged by her class's thoughtful discussions and enthusiasm after taking part in I'm a Scientist, teacher Polly knew she had to do it again. This time, Willows High School really made the most of their experience, by getting the whole of Year 8 involved.

"My Head of Department saw tweets about the calibre of questions my students were asking. Very soon, senior leadership wanted it to be rolled out for the entire year group."

"...By discussing careers with real scientists, the pupils saw how hard work would make them ideal candidates for a fulfilling career..."

Taking part shifted students' attitudes toward science. Students' unique experiences sparked conversations across the school, from the corridors to the playground. "They understand more now how science relates to their future" Polly found.

This kind of large group motivation not only re-energised and re-focused students toward their studies, but re-framed their perception of STEM careers.

GET INVOLVED!

Through I'm a Scientist, students discover science's breadth, its relevance to their world, and see it as something 'for them'.

Every student can:

- Explore profiles to learn about the scientists and prepare questions
- Chat in 30-minute text-based conversations
- Deepen their understanding with follow-up questions
- Decide which scientist gets their vote to win £500 to spend on further STEM engagement activities

Ready to bring STEM to life for your students? Visit **imascientist.org.uk** to find out more and get started today!

*Free for state-schools or state-maintained schools. 89% actively join a chat, ask a follow up question, post a comment, or cast a vote.

EAT SLEEP SCIENCE REPEAT

SPARK CONVERSATION AT LaBLiFe.CO.UK | La B Li Fe

MICROSCALE:
BIG MEETS SMALL

Microscale isn't just a fad; it's transforming science education

Imagine shrinking your experiments to a fraction of their usual size while still achieving amazing results. That's the magic of 'microscale' chemistry!

Microscale and **microscience** work together, using tiny amounts of materials and equipment to explore big ideas. Microscale focuses on practical methods, while microscience focuses on small-scale investigations.

Together, they represent a growing trend in science education, emphasising efficiency, safety, and precision with minimal material use.

WHY IS MICROSCALE CHEMISTRY BECOMING SO POPULAR?

- **Reduced Chemical Waste:** Smaller amounts = waste and lessens the environmental impact.
- **Enhanced Safety:** Smaller quantities reduce hazards, making experiments safer for all.
- **Lower Costs:** Less material not only saves money but also simplifies the logistics of set up.
- **Sustainability:** This approach is kinder to our planet, supporting sustainability in education.

These techniques allow for precise control over experiments and make them more engaging and manageable. Students get hands-on experience with advanced tools, which is both exciting and educational.

WHAT ARE THE CHALLENGES?

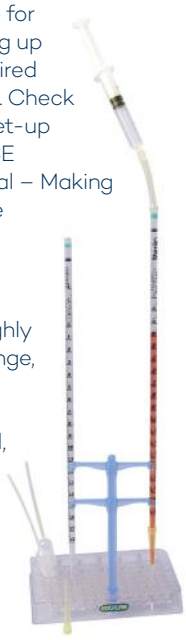
- **Limited Scope:** Some experiments might not be feasible on a microscale.
- **Specialised Equipment:** Microscale methods often require specific tools and equipment.
- **Visibility:** It can be challenging to observe certain phenomena as clearly as you would in larger-scale experiments.

Despite these challenges, microscale techniques are transforming science education. They make learning more accessible, safer, and environmentally friendly, often proving to be a valuable choice in modern classrooms.

READY TO DIVE INTO MICROSCALE CHEMISTRY? HERE'S HOW:

Adjust Your Quantities: Start by halving the quantities in your chemistry practicals. For example, if a procedure calls for 50ml of sodium thiosulfate and 10ml of acid, use 25ml and 5ml instead. This simple adjustment reduces waste and can have a big impact on your budget.

Stay Connected: Follow LaBLiFe on social media and visit our website for tips and methods on setting up microscale versions of required practicals and experiments. Check out the latest microscale set-up and demo of the AQA GCSE Chemistry Required Practical – Making Salts, presented by LaBLiFe ambassador Denise Ralph.



Explore Kits: Discover the range of microscience kits from various brands. We highly recommend the EduLab range, which includes basic and advanced kits, water monitoring tools, combostill, and titration kits. Don't forget to use promo code **LABLIFE** to enjoy a 10% discount on EduLab microscience kits at **vittaeducation.com**

Embrace microscale chemistry and make your science lessons more exciting, efficient, and eco-friendly... Share your experiments and ideas with the LaBLiFe community via **hello@lablife.co.uk**

See page 54 for a list of products featured.

THE TECH FILES

MAUREEN WADE

In the vibrant hallways of The Victory Academy in Chatham, meet Maureen Wade, the lead technician who embodies a passion for science and education that has fuelled her career spanning over four decades.

Maureen's journey into the world of science began back in 1981 when she landed her first job as a research technician at a major pharmaceutical company. Despite starting with little prior knowledge of what it entailed, she quickly fell in love with the work, setting the stage for a lifelong dedication to science and learning. Maureen then transitioned to roles as a higher education lab technician in pharmaceutical chemistry, followed by a period as a technical demonstrator. After a career break, she returned to both independent and state schools.

Her academic journey includes a degree in applied biosciences and a diploma in technical skills. Beyond formal qualifications, Maureen's role as an associate facilitator for STEM Learning highlights her commitment to continuous professional growth and development. These qualifications have complemented her practical experience, although she strongly believes that the key to being a great technician involves continuous learning and on-the-job expertise. Values she holds dear, Maureen prides herself on still learning now and continuing to do so.

At The Victory Academy, Maureen plays a pivotal role in the science department, serving as the STEM and Health & Safety Lead. She takes pride in designing practical, engaging curricula that not only meet educational standards but also spark students' curiosity and ensure their safety.

"I'm lucky that my school is appreciative and recognises the contribution technicians make to the quality of education offered. I have recently been involved in taking Year 5 sessions full of magical science and offering CPD to technicians across the Trust."

Maureen actively advocates for technicians, emphasising their crucial role in education. She fosters a collaborative environment where each member of the science department has a voice and equal value. Working as a team, the technicians participate in department meetings and provide professional development to both trainees and experienced teachers.

Beyond the school walls, Maureen embraces social media as a valuable tool for connecting with fellow technicians and educators worldwide. She finds great satisfaction in helping fellow technicians. Platforms like Twitter and LinkedIn serve as lifelines for many new and old technicians, providing opportunities to share knowledge, seek advice, and develop new skills.

Relishing the freedom to innovate, Maureen's heart of her work lies in the lab, where she thrives on building new kit and generating novel ideas. However, the most rewarding aspect of her job is seeing students' excitement during experiments, inspiring young minds and instilling a lifelong love for learning.

Playing a part in nurturing children's love for science is a privilege she deeply values. Maureen cherishes the relationships she builds with students and colleagues alike, enriching her daily experience.

Recognised for her contributions, Maureen recently received the Medway District Science Support Staff Award at the Kent Teacher of the Year Awards, underlining her impact and dedication throughout her illustrious career.

As she looks towards retirement, Maureen leaves behind a legacy of excellence and innovation at The Victory Academy. Her advice to aspiring and fellow technicians is simple yet profound: manage your time wisely, don't hesitate to seek advice when needed, increase your profile and ensure your contributions are recognised within the school.

Her mantra of learning to say 'no' when necessary, underscores the importance of setting boundaries while advocating for the value of technicians in education.

In summary, Maureen Wade embodies the passion, expertise, and dedication that defines an exceptional technician. Her career at The Victory Academy exemplifies the transformative impact of technical proficiency and a genuine love for fostering scientific curiosity in students. As she continues to innovate and inspire, her impact on students, colleagues, and the broader community serves as a testament to the power of committed technicians in transforming lives through science education.

Read the full report on Maureen by visiting our blog pages, and why not share your story to feature in next term's Tech Files. Email **hello@vittaeducation.com**

DISSECTING DISSECTION

"To teach the dissection of living organisms without making use of them is a contradiction in terms" – Claude Bernard

As the UK's leading supplier, dissection in UK schools, colleges, and educational establishments is more popular now than it has ever been. At Samples for Schools, we are often asked for tips, how-tos, tricks, or ingenious methods surrounding dissection and lab work, so I thought I would provide a few of the most popular and useful answers to make your preparation and lessons easier (and hopefully unique)...

How can I demonstrate how blood flows through the heart?

One of our technicians provides string which can then be threaded through the chambers and arteries to show the direction of flow, which seems to work very well. Another excellent addition to this is when you transect the heart to see the internal structures. If you find the heart strings and pull on them, you should be able to see the valve open and close (literally "tugging on the heart strings").

We struggle with inserting the tubing into the trachea to enable us to inflate the lungs. Is there an easier way?

Simply attach a glass rod to the end of your tubing, and inserting it will be so much easier. When the lungs have been inflated, if you cut a section of them, it will float in a beaker of water, which is quite "cool" for the students to see.

I am concerned about which year groups to allow the use of scalpels. Do you know?

Year 9 (and below) do not get access to scalpels; they will require dissection scissors and blunt forceps. As an aside, best practice is to use laminated sharps sheets (to wipe clean and use in the next class) so the teacher knows exactly how many they should be counting back in (including their own if they are doing a demonstration themselves).

How should I prepare my specimens from you once I have defrosted them?

This is always a question that comes up. Whether you have thawed them at an ambient temperature or in the fridge, once you have opened them, I would give them a rinse to remove any excess moisture. This avoids any disruption with any aroma in the lab on a hot day.

Our students find it difficult to study the lens once detached from the eyeball itself. Is there a better way to do this?

Yes, there is. Eye dissections are best done on a coloured background; this way, the lens is more visible when it's removed. Blue silicone pads are ideal for this, but if you do not have any, simply get the students to place the lens on a piece of blue paper towel.

We also provide a number of excellent teaching resources on our website, including full video tutorials, lesson plans, and risk assessments, which have been accessed and viewed over 30 million times. These are totally free of charge and can be very useful for further tips or even a little "refresher". I know I often need one.

We have been supplying Mainland UK (and parts of Europe) with dissection specimens for over 10 years now. We pride ourselves on our high-quality products (as we go through the main specimens by hand to ensure they are unslashed and optimal for dissection) and excellent customer service and ethics. These are all by-products of the food industry and are free from any chemicals or fixatives.

You may have seen us at conferences and exhibitions all over the country, possibly with an inflating lung to catch your eye. If you have not, please do look out for us. Despite the subject matter, we are very friendly and happy to answer any questions you may have.

In the meantime, please have a look at our supplies and services at **samples-for-schools.co.uk**

Samples for Schools | lab specimens to help unlock curious minds

ONE SMALL STEP

World Space Week: October 4-10 2024

Celebrated annually, World Space Week is the largest space event on Earth, uniting space enthusiasts, educators, and communities worldwide.

This year's theme is 'Space and Climate Change', and highlights the incredible ways space technology helps us tackle climate change. It shows how space exploration is key to improving our understanding and management of Earth's climate.

To make the most of World Space Week, we've put together some exciting hands-on experiments and ideas to bring the wonders of outer space into your classroom. Get ready to educate, inspire, and connect with your students in an engaging and fun way!

Get to know our Solar System with a **Motorised Solar System**. The model represents the Sun and eight planets, showcasing their relative positions and movements in an easy-to-understand way. The GeoSafari model has an ultra-bright 1000-hour light in the Sun, a Star Dome to project a starscape, and a guide booklet to help you explore the solar system's dynamics in depth.

Explore the wonders of gravity with a **Lascells Gravity Well**, a fascinating tool featuring marbles and a large metal ball. This hands-on apparatus helps students visualise how massive objects attract each other due to gravity. The set includes a flexible sheet that mimics curved space-time and a collapsible frame, making the study of gravity engaging and interactive. You'll dive into activities covering star formation, orbital periods, variations in force with mass, and the Earth-Moon trajectory.

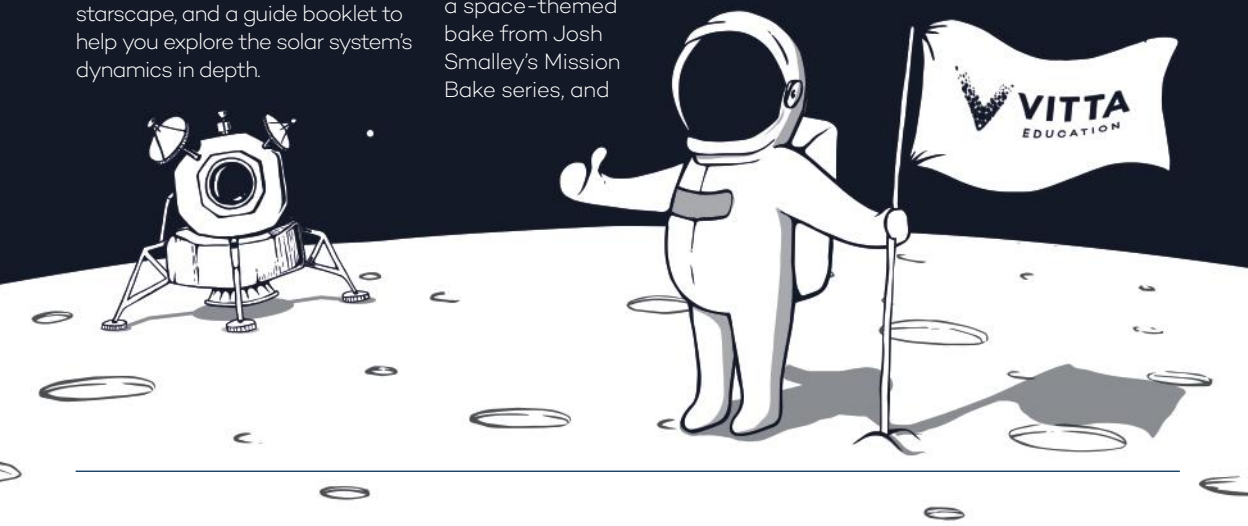
Josh Smalley's **Gingerbread Rockets** are perfect for World Space Week and school science activities because they blend fun with education, integrating science, math, and art while engaging students in hands-on learning about rocket design and space exploration.

These rockets are a space-themed bake from Josh Smalley's Mission Bake series, and inspired by ThorAble and Blue Streak on display in the National Space Centre rocket tower. If you have a go at these, please share any photos using **#MissionBake** or visit **vittaeducation.com/bake**

Treat your ears whilst star-gazing or at a space-related science fair with our galactic playlist that's out of this world...

Download the **World Space Week 2024: Space & Climate Change Poster** for your department, plus find a variety of education and outreach social media templates to encourage others to join in! Head to **worldspaceweek.org/media/poster/**

Whether you're decorating a classroom, promoting an event, or simply celebrating your love for space, share your event photos on social media and use the hashtag **#WSW2024**



WHY IS GRATNELLS **THE NUMBER ONE** CHOICE FOR SCIENCE TECHNICIANS?

Gratnells

"There's only one choice of tray for science technicians and that's Gratnells"

Paul Cook
RsciTech Hon.FinstP

- **No need to worry about spills with chemically resistant, recyclable polypropylene**
- **Anti-static additive prevents dust contamination and protects users**
- **A burn rate of 0.22mm/min ensures extra safety in the lab**
- **Can be easily moved and stored in multiple locations for flexibility**

It's no wonder that the Gratnells tray has become a staple item in so many laboratories and prep rooms over the past 50 years.

For more information on Gratnells products visit **www.gratnells.com**

YOUR TICKET TO A WORLD OF SCIENCE WONDER AND DISCOVERY...

New Scientist Live

Discover the Future of Learning with VITTA Education at New Scientist Live 2024!

12-14 October 2024 | Excel London

Join VITTA Education at **Stand C22** for an exciting journey into the future of learning at New Scientist Live, taking place at ExCeL London on October 12th, 13th, and 14th. This premier science festival offers a weekend brimming with thought-provoking talks, ground-breaking discoveries, interactive experiences, hands-on activities, and captivating performances.

For the first time, VITTA Education is thrilled to be part of this event. We encourage schools to take advantage of the special Schools' Day on Monday, October 14th. This day is crafted specifically for students in Key Stages 2, 3, and 4, featuring a dynamic programme tailored for students. Expect age-appropriate talks, engaging interactive experiences, and hands-on activities designed to extend learning beyond the classroom. This immersive experience aims to ignite curiosity and connect students with the scientific, social, and ethical challenges of the future.

At the VITTA Education stand, students will have the chance to dive into science with interactive talks, mini-science activities, and exciting opportunities to explore under the microscope with our live Moss Safari and more. It's a unique opportunity to explore STEM in a fun and educational environment!

WIN A PAIR OF TICKETS

We're excited to offer you a chance to win a pair of tickets to New Scientist Live for either Saturday or Sunday! To enter, simply answer this question: Which talk at New Scientist Live are you most excited to attend, and why?

Send your answer to **win@vittaeducation.com** by 30 September 2024. Don't miss this opportunity to explore cutting-edge science and technology, interactive exhibits, and inspiring talks.

Don't miss out on this unique experience to enhance your professional knowledge and enjoy a day dedicated to the wonders of STEM. We look forward to your entries!

Book your tickets today!

Explore the five stunning stages, hear from a whole host of incredible speakers, and discover over eighty exciting exhibits.

For more information about School's Day tickets and the festival schedule visit the website: **live.newscientist.com**

Competition entries close at 23:59 on 30/09/24.

VITTA A-Z Chemical Recipe Sheets are available to download on our website

Save yourself time in the prep room with more added each week, plus links to equipment and practical experiments.

vittaeducation.com/recipes

Download A VITTA TIME-SAVER

VITTA CHEMICAL RECIPE SHEETS

AS SEEN ON La B Li Fe

pH7 Buffer Solution

DIRECTIONS:

1. Using a balance, weigh out 1.52g of sodium dihydrogen phosphate and 2.27g of disodium hydrogen phosphate-2-water.
2. Using a beaker, dissolve both salts in 500ml of distilled water.
3. Use a glass rod or magnetic stirrer to mix thoroughly.
4. Transfer the solution to a 1 Litre volumetric flask.
5. Add more distilled water to fill the flask up to the 1000ml mark.
6. Mix thoroughly again.
7. Use a pH meter to check the pH of your buffer solution.
8. If the pH is ABOVE 7.0, adjust it using small amounts of HCl.
9. If the pH is BELOW 7.0, adjust it using small amounts of NaOH.
10. Use a pH meter and adjust the solution until it reaches 7.0.

GUIDANCE:

- Use precise weighing and volumetric equipment to ensure accurate concentrations.
- Dissolve all chemicals and adjust the final volume accurately.
- Calibrate your pH meter before use and adjust the pH of the buffer solution incrementally with acids or bases as instructed, mixing thoroughly.
- Handle chemicals carefully, and store the buffer solution in a well-sealed container, properly labelled with its pH and preparation date.

Like what you see? Download the full explanation of this recipe and find more online at **vittaeducation.com/recipes**

PRECAUTIONS: When preparing solutions always wear appropriate PPE including eye protection and gloves. Always add acid to water (never water to acid). Use a fume cupboard. You should always carry out a risk assessment when using any chemicals. Follow all recommended safety procedures and adhere to the label instructions, hazard warnings and local legislations.

Recipe extract shown. VITTA Education are not responsible for the outcome of this chemical recipe you try, or any website linked to from this recipe. For our full disclaimer visit vittaeducation.com

SUPPORTING STEM EDUCATION SINCE 1965

SSERC is a not-for-profit company and registered Scottish Charity committed to advancing Scottish education. Since 1965, we've partnered with all 32 Scottish Local Authorities, officially becoming a charity in 1991. We specialise in offering unique specific services focused on STEM subjects. Our goal is to provide educators with the tools and support needed to inspire Scotland's next generation of innovators.

Professional Learning Courses

Our professional learning courses include twilight sessions, day courses, and residential events that last up to three days, typically split into two parts. Many are available online, offering accessibility and flexibility.

Our diverse portfolio includes:

- Courses for probationers and newly qualified teachers.
- Subject-specific training for primary and secondary teachers.
- Transition courses to enhance collaboration between primary and secondary educators.
- Health and safety training, and design and manufacturing courses for technology teachers.
- Courses for science and technology support staff, many accredited and credit-rated by the SQA within the Scottish Credit and Qualifications Framework.
- Leadership courses.

Our resources are also available through our YouTube channel, SSERC TV, and our self-study courses on the SSERC Online Learning platform.

The Advisory Service

Managing risks responsibly and sensibly is important. We believe that health and safety legislation shouldn't hinder valuable learning experiences for young people. Thus, we provide training courses and guidance materials that simplify risk management and avoid unnecessary bureaucracy.

Our services include*:

- Specialist Health & Safety advice for members.
- Unlimited access to advisors in Primary Science, Biology, Chemistry, Physics, Technology, Technician Services, and Health and Safety.
- Guidance and compliance advice on Radiological Health & Safety legislation from our Radiation Protection Adviser.
- Free and subsidised Health & Safety management courses for Curriculum Leaders, inc. Radiological Protection.
- Access to our website for curriculum support materials, Health & Safety advice, exemplar Risk Assessments for specific subjects and whole-school activities, and recommendations on equipment and specialist accommodation design.
- Testing of apparatus to ensure safety, performance, and compliance with standards.

STEM Engagement

SSERC offers a variety of STEM engagement and enrichment programmes designed to boost access to and participation in STEM beyond the classroom. We provide leadership opportunities through the Young STEM Leader Programme and connect educators with industry partners and STEM Ambassadors. These collaborations help create exciting STEM learning events for students across Scotland and beyond.

Membership

We offer corporate and international membership and individual access to our digital publications via the SSERC digital bookshop. Contact SSERC to learn more:

t: **01383 626 070**

e: **enquiries@sserc.scot**

w: **www.sserc.scot**

T LEVELS CONTINUE TO GROW

"...I feel the benefits of the future are wide open since you've taken on this course..."

Three new T Level subjects available as the technical qualifications enter their fifth year

GATSBY

The three new T Levels – in Animal Care & Management, Craft & Design and Media, and Broadcast & Production – will start being taught across the country from September 2024, bringing the total number of T Level subjects available to 21.

T Levels are a level 3 technical qualification, equivalent to 3 A-levels and include a 45-day industry placement. Students can choose to take a T Level after their GCSEs, and they are offered at colleges and schools across England. This year will mark the fifth intake of students – a small number having started in September 2020 – and as the intake has grown, so to have the benefits to students, parents and employers alike.

For parents, carers and guardians, T Levels give their young people the confidence to explore their chosen industry and go into their next step – be that into the world of work, an apprenticeship or university – equipped with the right skills and knowledge to make an impact. Debra, mum of T Level Engineering student Memphis, said: "Since T Levels have come along, it's totally changed my idea of the skills that you can learn and where you can go. I feel the benefits of the future are wide open since you've taken on this course."

Speaking from an employer perspective, Helen Clements from Morgan Sindall Construction, said of the qualification: "T Levels, it's an absolute no brainier really. It's the ideal way of finding your future employer. It puts [students] ahead of their peers in the classroom, when they're interviewed by us, they know the jargon, they know what we do, they understand who we are, they want to work for us because they've enjoyed their placement with us".

Keep an eye out for T Level celebration week later this term (Monday 2 to Friday 6 December 2024) and be sure to share your own student and provider success stories.

Technicians: The David Sainsbury Gallery Celebrates its One Millionth Visitor

Technicians: The David Sainsbury Gallery, a free interactive gallery for 11-16-year-olds at the Science Museum, welcomed its one millionth visitor, with students from UCL Academy in north London joining one of the gallery's free Meet an Employee workshops. In the workshops, students get the chance to meet a real technician and experience what it's like to do their job through hands-on activities and Q&A sessions.

The students celebrated the milestone with Tyler Terry-Wallace, a Simulation Technician at Guys and St Thomas' Hospital, who was delivering their on-gallery workshop.

Laura Southall, Head of Learning at the Science Museum, said: "While every one of our visitors is special, I am delighted to welcome the millionth visitor to the museum today. Achieving this remarkable milestone is testament to the gallery's engaging design, interactivity and of course the technicians who deliver exciting, interactive learning experiences, and highlight the importance of technical careers. We're grateful to the Gatsby Charitable Foundation for enabling the museum to shine a much-needed light on these important careers through the gallery".

WHAT'S IT ABOUT?

Technicians: The David Sainsbury Gallery is a free and innovative hands-on gallery which champions the vital but unseen role of technicians and seeks to change perceptions of technical careers. Young people can go behind the scenes with technicians working in advanced manufacturing, creative industries, health science and renewable energy to explore where technicians work, hear their inspirational stories, and experience daily life as a technician.

Although an estimated 1.5 million technicians work in the UK – from archaeological technicians to veterinary nurses – few young people know about the pathways to these technical roles. Demand for these skilled jobs continues to increase, with 800,000 technicians and apprentices desperately needed across the STEM sector. The gallery helps to address demand for these important jobs, providing a one-of-a-kind space for young people to explore different technician roles, discover more about the varied routes into these important careers and to imagine themselves as technicians.

Find out more about free school group and public bookings to visit the Technicians Gallery at **sciencemuseum.org.uk/technicians**

Plus... visit **technicians.org.uk/educators** for free lesson plans and resources!

Information correct at time of print: September 2024.

T-LEVELS
THE NEXT LEVEL QUALIFICATION

CELEBRATE TOGETHER

T Level Celebration Week: Monday 2 December – Friday 6 December

T Level Celebration Week is a fantastic opportunity to highlight the amazing achievements of students who have embraced this exciting new qualification. Aimed at promoting and celebrating T Levels across the country, we are giving a shout out to some T Level students who have excelled in their chosen fields, demonstrating how these qualifications are opening up exciting career opportunities and making a real difference in their lives and communities.

T Level providers and employers can join in the fun during the week through events, social media, public relations (PR), and by using the hashtag **#TLevelsWeek**.

You too can get involved by:

- Sharing their personal experiences with T Levels
- Celebrating the successes of T Level students who've been hosted for placements
- Spreading the word about plans to host placements

MIDKENT COLLEGE CELEBRATES T LEVEL TRIUMPHS AND FUTURE PATHWAYS

MidKent College celebrated the T Level results for the 2022-2024 cohort, recognising the students' achievements and their progress into apprenticeships, higher education, or employment. T Levels have equipped students with essential academic knowledge and transferable skills to meet employers' needs across industries. This success is attributed to the support of longstanding and new employer links, as well as those helping to create future opportunities. Special thanks were extended to Steven Watterston and Peter Baker from AoC, and Sebastian Baker MSET ACMI from the Education and Training Foundation, for their ongoing support since the introduction of T Levels in 2020.

Scan to read more from Alison Ackroyd...

DISTINCTION AND DEDICATION

Trudi FitzPatrick, a standout student from the Wirral, achieved a Distinction in her T Level Science qualification, ranking among just seven students in England. Her passion for biomedical science is set to continue at Liverpool John Moores University. Known for her politeness, hard work, and enthusiasm, Trudi excelled in both her studies and a key industry placement at Arrowe Park Hospital. Cherished by her family and friends, she has received unwavering support throughout her educational journey. As she advances in her academic career, Trudi carries with her a strong foundation of skills and a love for biomedical science.

Scan to read Trudi's full T Level story...

FROM T LEVELS TO A TOP UNIVERSITY

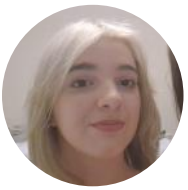
In the fast-paced world of science, Aaron Winstanley from Willaston, Cheshire, exemplifies the impact of vocational education. Through the T Level programme in Laboratory Science at Birkenhead Sixth Form College, Aaron achieved a Distinction, one of just seven students across England to do so. His journey, driven by a deep curiosity and a preference for hands-on learning, included a prestigious placement at AstraZeneca. His success led to an offer from the University of Liverpool to study Pharmacology. Aaron's story highlights the transformative power of T Levels, bridging education and industry while preparing students for professional success.

Scan the QR code to read Aaron's story...

A SUCCESS STORY OF DEDICATION AND EXCELLENCE

James Ward from West Kirby, Wirral, exemplifies the power of vocational education. A recent T Level Science graduate from Birkenhead Sixth Form College, James secured a placement at Innospec, a global leader in specialty chemicals, and subsequently achieved a Level 6 degree apprenticeship in laboratory science there. One of only seven in the country to earn a Distinction in T Level Science, James' success highlights the value of industry placements in bridging education and employment. As he begins his apprenticeship this autumn, James is set to play a key role in innovative research at Innospec. Well done, James!

Do you have a feel-good story to share? Whether it's about a student's success, a school's achievement, or a personal milestone in science education, we'd love to hear from you! Send your story to: **hello@vittaeducation.com**



FROM T LEVEL STAR TO FUTURE MEDICAL PIONEER

Nicole White, from Greasby, Wirral, has excelled in her T Level Science course, earning a Distinction and showcasing exceptional dedication. Her industry placement at Liverpool Clinical Laboratories sharpened her technical skills and deepened her understanding of clinical work. Overcoming academic challenges with resilience, Nicole's hard work has earned her a place at the University of Liverpool to study Therapeutic Radiography and Oncology. Her journey highlights the power of perseverance and commitment, paving the way for a promising career in the medical field and making her family and friends proud.

Scan to read Nicole's story...

If you're delivering or looking to implement T Level Science, we have a host of resources to support you. From lab lists and our fortnightly newsletter to the VITTA T Level Science Handbook, simply fill out our quick contact form for access and to talk with our team: **vittaeducation.com/T-Levels**

FUTURE READY:
POST-16 SCIENCE

Summarising the context of the post-16 reforms

From 2025, and in a series of staggered cycles up to 2028, all post-16 qualifications at level 3 and below will be reformed and must meet new criteria to be approved for funding. All other qualifications will have funding approval withdrawn.

The impetus behind the post-16 reforms was the 2011 Wolf Report, which identified that many vocational qualifications were not valued by employers, offering both poor employment prospects and progression routes to higher education. This was followed by the 2016 Sainsbury Review, which set out a plan for educational reform and crucially, advocated for a clear delineation between 'academic' and 'technical' education, and disposing of the previously nebulous term 'vocational'.

The intention of the new, reformed system will be to provide learners with high quality choices which will provide the best foundation from which to progress, either into higher education, or skilled employment. It is from these two progression outcomes that the terms 'academic' and 'technical' derive their core meaning.

- Academic education: courses whose primary purpose is the progression to higher education. Qualifications making up these programmes are likely to be 'knowledge-rich'
- Technical education: courses whose primary purpose is progression to skilled employment or further technical training. There are two branches of technical education: apprenticeships, which are mainly workplace-based, and technical qualifications, which are mainly classroom-based. Both programmes are built around knowledge, skills and behaviours.

HOW WILL THIS AFFECT LEVEL 3 SCIENCE ACADEMIC CURRICULA?

In the realm of academic education, A levels will remain unchanged, so learners will still have a choice between Physics, Chemistry, Biology and Environmental Science. The new addition to this space will be Alternative Academic Qualifications (AAQs). Despite the moniker 'new', these are in fact very similar to legacy applied general qualifications.

These are small (meaning the size of 1 A Level) qualifications that must be taken in a mixed programme with A levels, and funding rules will stipulate that learners must pair one AAQ with two A Levels. They will also have a minimum of 60% mandatory content and 40% external assessment by exam. Science AAQs have gone through approval and will be open for delivery from September 2025.

APPROVED AAQs:

Awarding Organisation	Subjects
Pearson	Applied Science
	Medical Science
International Baccalaureate Organisation	Biology
	Chemistry
	Physics
	Sports, Exercise and Health Science
WJEC-CBAC	Medical Science
OCR	Applied Science
	Human Biology

The fact that a much higher proportion of the assessment will be coursework in AAQs gives them a more vocational flavour, and perhaps caters to a different kind of learner. AAQs should augment and enhance the academic landscape and will likely see widespread usage in schools and sixth form colleges, allowing them to create a more well-rounded offer for students.

THE NEW LEVEL 3 TECHNICAL LANDSCAPE

General FE colleges will be seeking a different solution, however, as many do not offer A levels and therefore, will find little use in AAQs.
For these settings, technical programmes are more appropriate.

The Sainsbury Review proposed a new classification system of 15 occupational routes, containing over 220 occupational standards at Level 3 (and many more from Levels 2 to 7). The 'Health and Science' route contains 4 pathways:

- Health
- Healthcare science
- Science
- Community exercise, physical activity, sport and health

Each occupational standard has knowledge, skills and behaviours, and it is on these that both apprenticeships and technical qualifications are built. In Science, the technical qualification that will see use is the 'T Level'.

T Levels are two-year qualifications designed to prepare learners for employment in industry through a mix of:

- Technical knowledge and skills
- An industry placement of at least 45 days
- Relevant maths, English, and digital skills

Launching in September 2021, NCFE spearheaded the development of the Health, Healthcare Science, and Science T levels, working with over 133 leading health and science sector bodies, employers, expert practitioners and training providers.

The Science T Level has a core component of knowledge and skills giving a broad look into the health and science sector, along with an occupational specialism, where learners choose one of three pathways:

- Laboratory Sciences
- Food Sciences
- Metrology Sciences

Before the Science T Level, there was no obvious route for non-degree learners to enter the industry. The aforementioned three pathways have a multitude of technician roles, but A levels did not provide the workplace skills required to move into them straight from further education.

WHERE TO FIND MORE INFORMATION

Whilst A Levels and AAQs will feel familiar to many educators, T Levels feel like an intimidating step, particularly for schools. Nevertheless, in the health and science sector they are an extremely important addition to the landscape, and we would encourage everyone to investigate them further.

Find out more... NCFE have a plethora of information about T Levels and the reforms in general on our webpage and YouTube channel. Visit **ncfe.org.uk** to find out more.

Information correct at time of print: September 2024.

OCR STEM CONTRIBUTORS

Resources supporting representation for secondary science qualifications

This magazine has recently highlighted challenges related to inclusive science teaching and the work of the Inclusion in Science Programme offered by the Association for Science Education. To support teachers in this important area, OCR has developed a set of resources that showcase a wide range of roles and represent people who challenge some common stereotypes of who does science.

HOW THE RESOURCES WORK

For each of our GCSE and A Level qualifications, we've created a spreadsheet that can be filtered. For each of the STEM contributors listed in the resource, we indicate a section of the specification that relates to their work, and we give a concise biographical note and a link to an external website.

WHO ARE STEM CONTRIBUTORS?

When we talk about STEM contributors, we are consciously including:

- people who contribute to the development of STEM knowledge and understanding (for example science researchers in universities)
- people who contribute to society through their work using their STEM knowledge and skills (for example, a broadcast engineer).

Our resources celebrate STEM contributors in diverse roles, including early career researchers, apprentices, undergraduate and postgraduate students, those working in industry, public service and in academic research.

Many are still working today, others are retired, and some are no longer living. Some have won awards or prizes for their contributions, but we are delighted to include many people who have not received such public recognition for their work.

"...We want to help teachers to challenge this stereotype by highlighting to students that STEM contributors are diverse... and roles are varied and rewarding..."

CHALLENGING STEREOTYPES

For many years, STEM has been perceived as lacking diversity, and indeed has lacked diversity. The current stereotype of a scientist is an old(er) white man. We want to help teachers to challenge this stereotype by highlighting to students that STEM contributors are diverse, and that roles in STEM or using STEM are varied and rewarding. We want students of all identities and backgrounds to know that they can feel valued, happy and well rewarded working in STEM related jobs.

TAGS USED IN THE RESOURCES

The Institute of Physics Limit Less campaign has identified five groups that are under-represented or under-served in the physics community. Based on these groups, each person mentioned in our new resources has been tagged to help you to find STEM contributors who:

- are women
- are from minority ethnic backgrounds
- are LGBTQIA+
- have a disability and/or neurodiversity
- are from a lower socioeconomic background, or from a background likely to have lower science capital.

We've been sensitive in our tagging; we want to describe people as they would describe themselves.

MAPPING TO OUR SCIENCE SPECIFICATIONS

To help you to highlight people within the context of your regular teaching. For each contributor, we indicate an area of the specification that matches their work.

HOW TO USE OUR NEW RESOURCE

To make this resource easy to use, each spreadsheet includes a number of filters.

To find contributors for a teaching topic, teachers can apply a 'specification content' filter; unselecting 'blanks' will show every person we have tagged to that section of the specification.

As with any Excel spreadsheet, filters can be applied individually or together, so, for example, it's possible to look for women from minority ethnic backgrounds tagged to a particular part of the specification.

Using the filters, you can find a broad range of people, with different identities and from different backgrounds, involved in very different work, but all are contributing (or have contributed) to STEM or through STEM.

SIGNPOSTING TO MORE INFORMATION

For each person we have included in the resource, we have provided a short biographical note, and a link to an external website where students or teachers can find out more about that STEM contributor.

GATSBY BENCHMARK 4

According to Gatsby Benchmark 4, "STEM subject teachers should highlight the relevance of STEM subjects for a wide range of future career paths."

By applying the specification filters, it's easy to find diverse contributors with different roles in STEM for any area of the specification. You can share our short biographies with your students and direct them to the websites the resource recommends. Many of the careers oriented sites help students to contextualise their learning, helping them to make informed decisions about career paths.

Get your FREE resources...

The resources are all free, and can be downloaded from the OCR blog. The blog gives more ideas about how to use the resources and gives links for suggestions for additions for future versions.

Scan the QR Code or head to **ocr.org.uk**

Written by: Ally Davies, Science Subject Advisor, OCR.

READY, STEADY, BAKE:

CHEMISTRY IN THE KITCHEN

Get inspired and be on the look out for...

Great British Bake Off – Season 15
September-October

Biology Week
7-11 October

National Baking Week
14–20 October

Chemistry Week
4-10 November

Meet Josh Smalley, a chemistry research associate and science communication champion at the University of Leicester. Josh has spent the last 10 years at the University, having completed an MChem in Pharmaceutical Chemistry, followed by a PhD in Chemical Biology before beginning his postdoctoral research. But whilst chemistry is a strong passion for Josh, it is another of his passions that brought him to our TV screens last year. In 2023, he was a finalist in the 2023 Great British Bake Off and captivated audiences with his skilful techniques and mastery of flavours. Being equally accomplished in the laboratory and the kitchen allows Josh to infuse his culinary creations with a unique understanding of the molecular make-up of the bakes he showcases. And with a strong passion for STEM education and inspiring the next generation of young scientists, a big part of his new role is bringing chemistry and the related sciences to life through the art of baking and cooking.

At the University of Leicester, Josh has created an incredible space called the Science Kitchen, where he delivers demonstrations, talks, research, and events showcasing baking creations along with the science behind them. The Science Kitchen engages with schools and the community, making science accessible to those in the city, county, and beyond. During recent events in the Science Kitchen at Open Days, students were able to experience a 'Science of Baking' demonstration from Josh, revealing the chemistry behind making caramel and the science behind the perfect sponge – complete with tastings at the end! These demonstrations are supplemented with additional chemistry activities such as making molecular models of the chemical compounds featured in the presentation. And for out-of-this-world bakes, Josh has been working alongside the National Space Centre in a series called Mission Bake,

in which he creates space-themed bakes using the amazing artefacts on show at the National Space Centre as inspiration. From planet macaroons to an Apollo Lunar Lander cake, all of these creations are filmed and released as video reels, complete with space and science facts. By linking science topics with a real-world subject area such as baking, Josh hopes to get students excited about science and encouraged to get involved themselves and want to learn more.

With a large following on social media, Josh extends his science communication influence to Instagram (@joshpsmalley), showcasing the science of baking, providing updates on events at the Science Kitchen, and promoting a fascination with science. Josh is the first chemistry champion for the Salters' Institute, an educational charity which promotes the teaching and learning of chemistry. He is participating in their programmes to assist with fundraising and share how chemistry and the related sciences influence our daily lives, especially with their many parallels with baking. Having always been a passionate advocate for science communication, Josh is on a mission now to use his platform from Bake Off to make a difference.

MARVELLOUS MUFFINS

Berries, such as raspberries, strawberries, blueberries and blackberries are a great source of source of antioxidants. These fruits all have very vibrant colours and a class of natural, coloured pigments called anthocyanins that are in part responsible for this. Interestingly, these anthocyanins can change colour in different pH environments from red-pink in acidic environments to blue-green in alkaline environments due to a change in their molecular structure.

To demonstrate the colour changing ability of anthocyanins in different pH environments, this baking experiment will see if we can get our blueberries to change colour!

INGREDIENTS

- Basic Muffin Batter
- 200g self-raising flour
- 150g granulated sugar
- ¼ teaspoon salt
- 80ml vegetable oil
- 1 large egg
- 80ml milk
- 1 ½ tsp vanilla extract

CAKE A

- 1 tsp baking powder
- Zest 1 lemon
- 2 tsp lemon juice
- 16 blueberries (chop in half)

CAKE B

- ½ tsp bicarbonate of soda
- 1 tsp milk
- 16 blueberries (chop in half)

METHOD

- Measure out the ingredients for the Basic Muffin batter and mix together in a bowl with a whisk or wooden spoon.
- Once mixed, divide the muffin batter into two separate bowls and label them 'A' and 'B'.
- Add the baking powder, lemon zest, lemon juice and chopped blueberries to Bowl A and mix together.
- Add the bicarbonate of soda, milk and chopped blueberries to Bowl B and mix together.
- Cover the bowls with cling film and leave in the fridge overnight.
- The next day, preheat your oven to 200°C (180°C fan) and prepare a 12-hole muffin tray with 12 cases inside (2 different coloured cases would be helpful here!).
- Spoon dollops of the muffin mixtures into the muffin cases, remembering which are A (with lemon) and which are B.
- Bake in the oven for 15-18 minutes.
- Once baked, transfer the muffins to a wire rack to cool.
- Open up the muffins and look at the colour of the sponge stained by the blueberry juice. Muffins A should be red, whereas muffins B should appear blue/green.

A full explanation of the recipe can be found online at **vittaeducation.com/bake**

GINGERBREAD GENETICS

Julia Milligan brings forth an innovative idea to help make the difficult topic of genetics more accessible.

Genetics is a funny subject: students either seem to get it straight away, or it's completely incomprehensible. Sadly, genetics doesn't lend itself easily to practical work in schools anymore - as few can afford to run extended experiments.

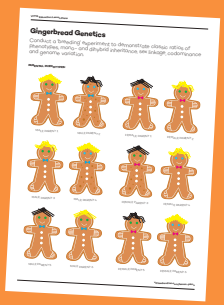
Previously, school genetics practicals involved 'breeding' experiments with organisms that had visible inherited traits and short generation times. The popular choice was the fruit fly, Drosophila melanogaster, due to its large number of breeding genotypes. However, these flies are small, hard to handle, and they are master escape artists (and it's amazing how long they can survive in the department after the experiment has been completed). Rapid cycling brassicas, or fast plants, which complete their life cycle in six weeks, are easier to manage but still take time to yield results. Nowadays, obtaining different genotypes in the UK is challenging.

This experiment you to conduct a 'breeding' experiment in just one lesson. It's infinitely adaptable - you can assign any traits to the parent organisms and manipulate them to demonstrate classic ratios of phenotypes, mono- and dihybrid inheritance, sex linkage, codominance, and genomic variation. It's distinctive from typical science practicals and memorable for students. Although it requires some preparation, most resources are reusable.

You will need to prepare a parental phenotype picture with matching chromosomes for each of the crosses you want to carry out. If you want the students to eat their creations, you'll need to move to a classroom or food tech room. Alternatively, use blank gingerbread man diagrams in plastic pockets with dry wipe pens to draw features.

THE EXPERIMENT

Imagine a population of gingerbread men. They have seven inherited characteristics: number of fingers, number of toes, hair colour, hair type, eye colour, gender, and presence/absence of spotty disease. Your task is to carry out crosses between these gingerbread men to determine how a chosen number of these characteristics are inherited.



Each group will need:

- Mini gingerbread men (available from most supermarket bakeries)
- A selection of coloured writing icing (for economy, you can fill a number of 1ml syringes from a single tube of writing icing
- Diagrams of parental phenotypes, complete with a matching set of chromosomes (in an envelope)
- Diagram showing recessive/dominant alleles of each gene

Get ahead and grab the lesson plan...

Download this lesson plan and many more online to help save valuable planning time!

MONOHYBRID CROSS

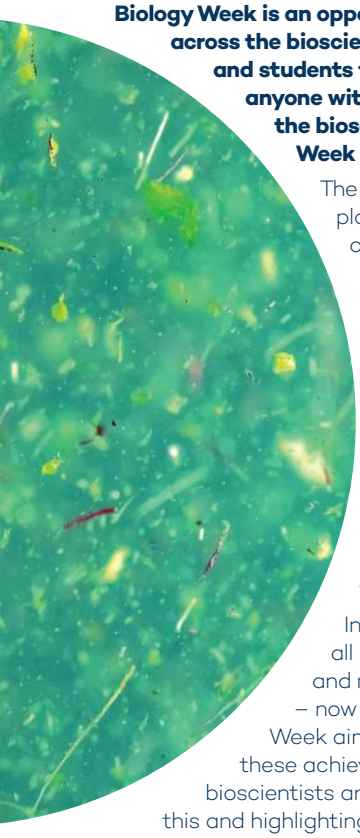
To investigate the inheritance pattern of a single trait, we will conduct a monohybrid cross by breeding two organisms with differing alleles for that trait and analysing the resulting phenotypic ratios in the offspring.

1. Pick two parents (one with blue chromosomes and the other with pink chromosomes).
2. Sort the chromosomes into blue pairs and pink pairs of equal length.
3. Take the chromosomes marked F / f. Put the others back into the correct packet for now.
4. Using a Punnett Square write the letters as shown for each paternal (blue) chromosome on the table, with one letter in each square. Repeat this for the pink chromosomes. Use red and blue pens/ink to help identify which is which.
5. Fill in both the maternal and paternal letters where the rows and columns overlap.
6. Ice the gingerbread babies to show their inherited features. What do you notice?

Visit the VITTA Education website for the full experiment, including how to perform a simple dihybrid cross and other activities.

BIOLOGY Week

Monday 7 October – Friday 11 October



Biology Week is an opportunity to bring together people from across the biosciences sector – from researchers, teachers and students to people working in industry and anyone with an interest in biology – to celebrate the biosciences. The theme of this year's Biology Week is 'Biology for a better tomorrow'.

The week will see a variety of events take place in person and online to foster conversations and connections, enabling people to come together wherever they are in the world.

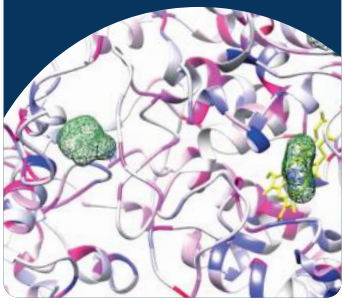
RSB Chief Executive, Dr Mark Downs CBiol CSci FRSB, said: "Biology Week is a chance for everyone with an interest in biology to come together, whether they are teachers, students, academics or industry specialists, to share knowledge and put the focus on the importance of biology to all. It is a pivotal time in the RSB's calendar and I'm looking forward to this year's fantastic line-up of events."

Innovation in biology will help us to support all life on Earth – from biomedical science and mycology to ecology and anatomy – now and in the coming decades. Biology Week aims to celebrate and raise awareness of these achievements and the important work that bioscientists are doing by generating conversation around this and highlighting it to public audiences.

National events during the week will include:

- Molecular modelling, coral reef research, and studying wildlife from space online talk / Q&A
- An opportunity to create a biology-inspired 3D artwork from recycled, or other, materials to enter into the RSB BioCraft competition
- The return of the RSB's 'A to Z of the Biosciences' – short films shining a spotlight on different bioscience careers – returns for a third series launching weekly videos starting in Biology Week
- A new online RSB Memory Game launches
- The nation-wide biology National Spelling Bee competition final

To book or to take part in any of these events ideal for schools, head online to **rsb.org.uk**



Getting Involved!

Dress up your science department with downloadable assets and logos to use for promotion, and don't forget to use the hashtag **#BiologyWeek** when posting on social media.

Organisations and individuals are also encouraged to host their own events as part of Biology Week, with funding of up to £1,000 available to RSB members hosting an outreach event.

Royal Society of Biology

More information can be found online by scanning the QR Code, visiting **rsb.org.uk**, or by emailing **events@rsb.org.uk**

See page 54 for a list of all the products featured.

Make the most of Biology Week with some more fun activities to try...

Snack Science Sizzle: Measuring food energy using calorimetry gives students a hands-on way to explore the nutritional value of their food and make healthier choices. In this experiment, students burn small food samples and record the heat released to see how energy transforms. Encourage them to experiment with different foods or variables, boosting creativity and critical thinking while reinforcing scientific principles. For example, they could compare processed foods with whole foods, test how energy measurements vary under different conditions, and link their findings to real-world topics like sports nutrition for a more in-depth understanding.

Microscopic Life: Put on your explorer's hat and dive into the fascinating world of mossy plains and pond water. Using microscopes, you can discover a variety of tiny organisms, from paramecia and amoebas to rotifers, as well as the exciting 'Big Five' of the Moss Safari. Explore miniature ecosystems filled with tiny insects and unique fungi. Both the pond sampling scavenger hunt and the Moss Safari (VTT12307061) introduce students to microbiology and ecology, linking these activities to broader curriculum goals. They promote scientific inquiry and environmental awareness engagingly. By highlighting the importance of ecosystem health, these activities inspire students to value and work towards a sustainable future.

Photosynthesis Colour Quest: To help students grasp environmental awareness and sustainable practices, explore photosynthesis by observing how a colour-changing indicator reacts to carbon dioxide levels. Place fresh elodea, or similar, in a bicarbonate solution with Bromothymol Blue, which turns yellow in acidic conditions. When exposed to light, the plants perform photosynthesis, reducing carbon dioxide and turning the solution blue. In the dark, the solution stays yellow, showing that no photosynthesis is happening.

This engaging experiment demonstrates how plants convert light energy into chemical energy and highlights the role of carbon dioxide. Using a colour indicator makes tracking the process visually exciting, and for an extra touch of fun, consider adding a time-lapse video or a creative TikTok-style dance to enhance the learning experience.

Why not take photosynthesis to the next level with PASCO's Photosynthesis Chamber (PS-3251) which enables you to monitor and explore photosynthesis using a fully controlled and measurable aquatic environment?

Adding some creative twists to your hands-on biology activities can truly bring science to life. Not only will it foster critical thinking and problem-solving skills, but it will also inspire the next generation of scientists and biologists!

Foster 'a better tomorrow' in the classroom... Download these lesson plans and find even more online for physics, chemistry and biology.

Get a head-start in the classroom at **vittaeducation.com/lesson-plans**

Log on to VITTA for our series of Required Practicals for GCSE and A-level.

Find all the in-depth information and advice you need, plus video links and one-click equipment list ordering.

Practical extract shown. VITTA Education can not be held responsible for any undesired outcome of this, or any other practical experiment you try. For our full disclaimer visit vittaeducation.com

Download A VITTA TIME-SAVER

REQUIRED PRACTICALS

Physics: Forces and Extension

Investigate the relationship between the force applied to a spring and its extension.

EQUIPMENT LIST:

The full equipment list can be found at **vittaeducation.com/practicals**

METHOD:

1. Measure the initial length of the spring without any weights (this is the natural length). Record this length for 0N as 0cm extension in a suitable table. No force means no extension.
2. Add a mass holder to the free end of the spring. This is where you will hang the weights.
3. Measure the length of the spring and the new length of the spring in the table.
4. Gradually add weights to the spring and measure the new length each time.
5. Record the amount of extension (the difference between the new length and the original length) and the corresponding force (the weight added).
6. Stop when your spring shows signs of reaching the limit of proportionality. Ensure not to overstretch your spring.
7. Plot a graph of force (x-axis) against extension (y-axis).

TIPS:

Always ensure the spring is at a right angle to the ruler, if the spring is not vertical or aligned correctly, the measurements of extension could be inaccurate. Any tilt or misalignment can cause errors in the length measured, affecting the results of the experiment.

LEARNING OUTCOMES:

By using this method students will have the opportunity to develop the following aspects of the physics AT skills:

AT1 and AT2. See website for full descriptions.

Like what you see? Download the full explanation of this practical and more online at **vittaeducation.com/practicals**

Take a closer look at your next study microscope

Duralab

Seeing is truly believing with DuraLab's comprehensive range of educational microscopes.

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Select the perfect microscope tailored to your requirements from our three specification levels: Classic, Advanced, and Pro.

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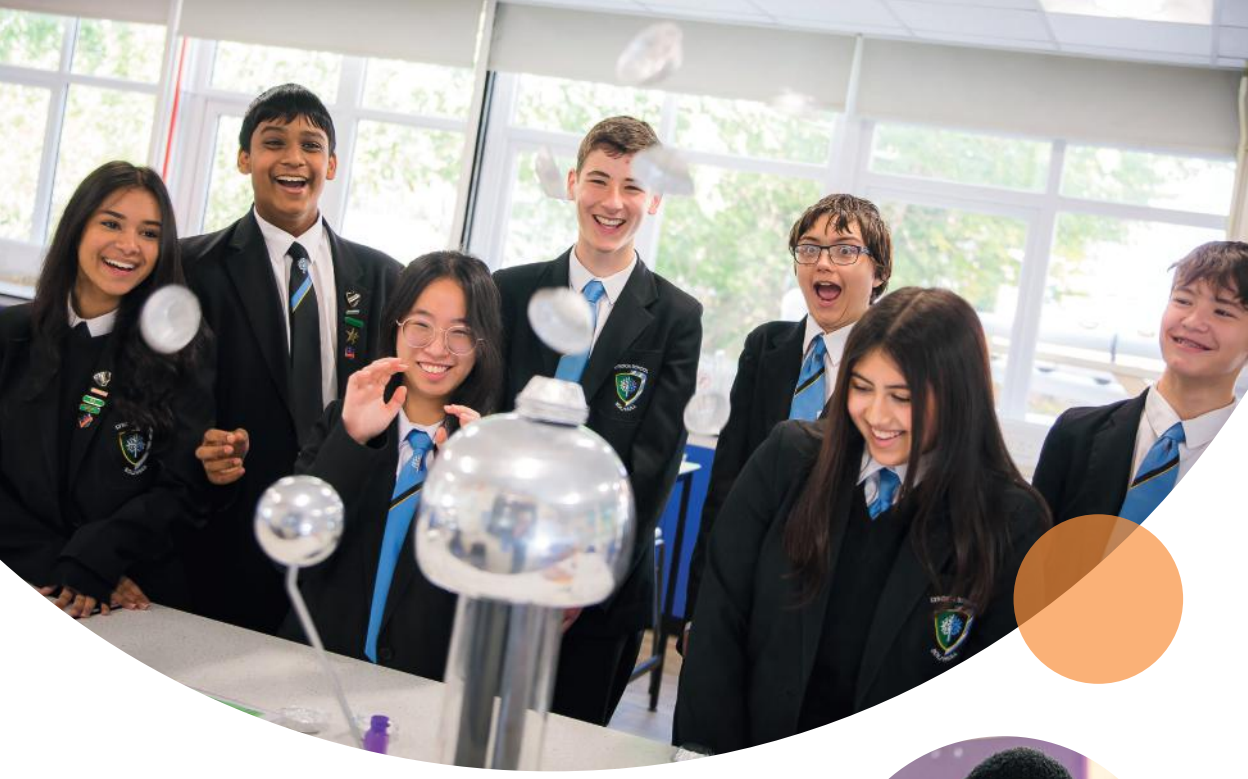


PHYSICS IN PARTNERSHIP

Gain rich rewards with the Ogden Trust

Partnerships are a fantastic way for schools to share their strengths and work together to improve their support for teachers and their opportunities for students. When done well, partnerships provide rich rewards for all involved, sharing best practice, improving pedagogy and enrichment, and sharing subject enhancement opportunities.

Partnerships can help improve communication and understanding between phases and schools, enhancing transition and forging solid physics foundations, all of which can have a positive impact on engagement, outcomes and results. The Summit Learning Trust family is currently made up of three secondary schools, five primary schools and a sixth form college educating over 8,000 learners. Working together in partnership is central to their make-up as a federation of local schools, but they have also formed an Ogden partnership to enhance their physics teaching and learning.

The Summit Learning Trust is one of 39 Ogden established collaboration partnerships. This partnership strand was formalised in 2022 to ensure the programme was able to support the growing number of academy trusts and school federations which can leverage existing structures for support and add real value.

"Our Ogden partnership is a trust-wide opportunity for people to get involved in and a great way of showcasing how we can work together cross–phase," says Rebecca Lillington, the Summit Learning Trust's Professional Learning Institute Director. "The amazing opportunities that come from our Ogden partnership for our learners, for their families, for the teachers, have been really, really powerful," she adds.

Written by the Ogden Trust: September 2024. **Images:** Lewisham Partnership, Phizzi CPD, Summit Partnership.

Joining the Ogden partnership programme was part of Summit's commitment to building a shared ethos and learner experience. They saw the partnership as an opportunity to up-skill their non-specialist physics teachers and primary science teachers as well as offering learners more STEM-related experiences. The formation of the Ogden partnership has provided new and exciting opportunities for cross-academy and cross-phase collaboration, planning and development by colleagues from across the Summit family.

Connections with other teachers through partnership meetings and events have led to a growing awareness of other phases, helping teachers at all key stages understand what their learners need to prepare for and where they have come from.

As a result of the Ogden partnership CPD, teachers have reported increased confidence in teaching the curriculum and feel more skilled to use the resources provided. Partnership events have inspired ideas for practical lessons, new ways to approach topics, and shown how physics links to real-life issues and STEM careers. Students of all ages have enjoyed the various Ogden partnership activities. Through them they have been exposed to new ideas, high-level concepts, and a wide range and diversity of jobs, stretching their knowledge of physics and where it can lead them next.

The Ogden Trust has been supporting school science partnerships for more than 15 years. There are 121 current partnerships in the programme involving more than 1,200 schools; 31 new partnerships officially start their partnership journey in September.

"...When I first heard of the Ogden Trust and saw the opportunities that they were offering for 'free', I was a cynical headteacher and it was hard to believe. But our Ogden partnership has given us free access to a wealth of knowledge, expertise and support... with a game changer being (Ogden partnership) funding to enable you to do more..."

Headteacher, Russell Scott Primary School, Tameside

The Ogden School Partnerships programme provides five years of funding, support and CPD for schools who want to work together to enhance the teaching and learning of physics. The programme facilitates primary and secondary schools to build relationships that support the learning of physics and the physical processes from the early years through to secondary.

Applications for new school partnerships open annually between September and January. This year, the Trust will be focusing the programme on priority areas that have high indicators of deprivation and low levels of physics and STEM engagement.

For more information on the priority areas and the application process, please visit the Ogden website: **ogdentrust.com/school-partnerships**

Not in a partnership but want to improve physics teaching and learning at your school?

Fully funded subject knowledge for physics teaching (SKPT) CPD is available from The Ogden Trust. For dates and details on the SKPT programme, go to **stem.org.uk/skpt**

New FOR AUTUMN '24

As a new academic year begins, it's the perfect time to explore new products and innovations.

DuraLab, a fresh name in the market, offers high-quality laboratory equipment that's both affordable and built to last. The DuraLab Advanced Precision Balance range is ideal for any science department, combining precision, durability, and ease of use. These balances feature high-precision load cells for accurate measurements, durable plastic housings, stainless steel pans, and a simple 5-key menu. Additionally, the clear, backlit LCD display ensures easy reading and a 5-year warranty guarantees reliable performance, making these balances a smart investment for education.

For those needing ultra-high precision, the DP-303W (DRL0050), pictured, is your go-to option, while the DP-3002 (DRL0049) offers higher capacity with excellent accuracy. For everyday lab work, the DP-1002 (DRL0048), strikes a perfect balance between precision and capacity, making it a dependable choice.

Good things come in threes, and DuraLab's Microscope range is no exception. Available in Classic, Advanced, and Pro specifications, the range meets a variety of needs. The DuraLab DF-100 Classic Monocular Microscope (DRL0039) is an education staple, competitively priced at £128.

Whether you're a beginner or an experienced user, the DF-100 is designed for versatility and durability, ensuring a smooth and enriching learning experience. Like all DuraLab microscopes, it comes with a 5-year warranty, highlighting DuraLab's commitment to quality and continuous learning.

In addition to balances and microscopes, DuraLab offers a selection of centrifuges. The M2 Mini Lab Centrifuge (DRL0035) is perfect for GCSE science experiments due to its compact size and ease of use. For more advanced applications, the C15 Clinical Lab Centrifuge (DRL0036) is better suited though it might be more than what's needed for GCSE-level work. For a simple and reliable option, the M2 Mini Lab Centrifuge is a solid investment.

In addition to balances, microscopes, and centrifuges, DuraLab introduces the Multi-Use Laboratory Trolleys. These trolleys are designed to make your work more efficient, built to last, and offer versatility to meet a range of needs.

Lightweight and chemical-resistant, these trolleys can support up to 250kg and come with precision-bearing rubber castors for smooth 360° movement, with two brakes for safety. Made from durable nylon fibre-blended polymers, these trolleys can withstand tough conditions. Customisable options include deep shelves, lidded storage bins, pneumatic wheels, and lockable cupboards, all while enjoying an ergonomic design that looks great in any lab and made using recycled polypropylene materials.

On the data logging front, PASCO Scientific has introduced OLED (organic light-emitting diode) displays to three of its popular wireless sensors: the Wireless Temperature Sensor with Digital Display (PS-4201), Wireless pH Sensor with Digital Display (PS-4204) and Wireless Conductivity Sensor with Digital Display (PS-4210). These sensors offer real-time readings visible on the display, providing instant feedback without the need for additional software, even during outdoor activities. This immediate data visualisation engages students and supports interactive, hands-on learning, making these sensors ideal for both classroom and fieldwork.

If you'd like more information, a product demo, or a quote, just drop us a quick email to **hello@vittaeducation.com**

Prices correct at time of print: September 2024.

Spooky SCIENCE

Forensics is a fantastic theme to bring some Halloween fun into your lesson planning. Imagine turning your students into detectives, solving spooky "crimes" while exploring real-world applications of chemistry, biology, and physics.

It's a great way to make science feel like an adventure, where students can investigate "crime scenes," analyse "evidence," and use their critical thinking skills to crack the case. The mysterious and eerie vibe of forensics is perfect for Halloween, making the learning experience both memorable and impactful. Plus, it's a wonderful way to get students excited about science in an interactive and hands-on way.

Fingerprint analysis is a superb forensic activity with a Halloween twist. Students start by using fingerprint powder (VTN12301674) to reveal hidden prints on spooky surfaces, like faux spider webs or ghostly silhouettes. This introduces them to chemical reactions and physical analysis techniques. Next, they lift the prints using clear tape (ZFK080171), just like real forensic scientists would. A feather duster (ZFK070040) helps to gently brush away extra powder, focusing on precision and keeping the evidence intact. To make the activity even more engaging, consider setting up a mock crime scene in a "haunted house", or adding props like fake cobwebs and eerie sound effects. This hands-on experience not only teaches scientific methods and practical skills but also deepens students' understanding of scientific inquiry and problem-solving.

If you're short on time, there are some excellent kits available that provide a convenient way to run complex experiments. Everything is included, making it easy to set up.

1. Case of the Murdered Mayor Kit: Step into a real-life mystery with this kit (VTN12301696), where students work together to solve the case of the murdered mayor. It's a fun and immersive way to explore biological concepts like evidence analysis and forensic biology.

2. DNA Forensics Lab Investigation: Dive into the fascinating world of DNA analysis with this hands-on lab (VTN12301704). Students get to apply biology and genetics concepts to solve a crime, making complex scientific principles both tangible and relatable with real-world applications.

3. DNA Murder Mystery Lab Investigation: If your students love a good mystery, they'll enjoy this kit (VTN12301703), which focuses on solving a murder using DNA evidence. It's a fantastic way to help them understand genetic markers and how DNA plays a key role in forensic investigations.

4. Forensic Mystery with Synthetic Blood Kit: Let your students play detective with this kit (VTN12301701), where they analyse synthetic blood samples to crack a forensic mystery. It's a great tool for teaching blood composition, blood types, and the basics of forensic serology – delivered in a thrilling, slightly creepy investigation.

5. Gunshot Residue Presumptive Test Kit: Bring the physics and chemistry of forensic science into your classroom with this kit – (VTN12301692). Students will test for gunshot residue at a simulated crime scene, giving them a hands-on way to learn about chemical reactions and evidence collection.

Make your Halloween science lessons a hit with these exciting kits and educational resources at **vittaeducation.com**

CHEMISTRY Week

Monday 4 November – Friday 10 November

This annual celebration of the chemical sciences is something we look forward to every year as it is encouraged to celebrate the wonders of chemistry throughout the whole month of November. The theme of this year's Chemistry Week is 'chemistry is shaping the future'.

From reducing our carbon footprint and improving nutrition to creating sustainable materials, chemistry drives positive change in every aspect of our lives. It's all around us – shaping everything we touch and wear, developing life-changing medicines, and providing solutions to energy and water challenges, helping us live more sustainably.

Get up to £500 support for Chemistry Week 2024

You could get up to £500 in grants toward an activity to get your students thinking about how chemistry is all around us, and how it can shape our future and their future career. Themes could include (but are not limited to):

- **Clean air/water**
- **Clean energies**
- **Sustainability**
- **Climate and environment**
- **Careers in chemistry**

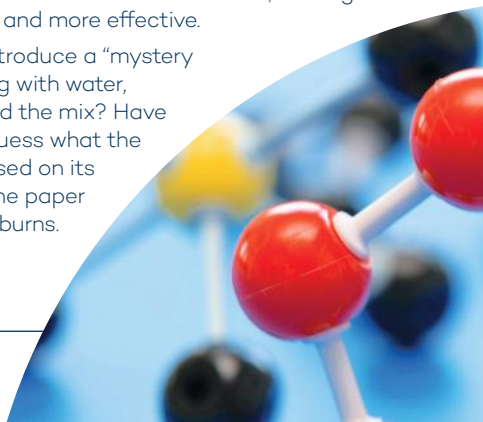
Applications are open now and there are 2 out of 3 rounds of deadlines left, 9th September and 7th October.

Learn more, apply for your support and find out about other grants by visiting **rsc.org**

Here are some great hands-on experiments and ideas to try to celebrate and inspire the chemists of the future...

Magic Paper Show: Captivate all ages with the magic of chemistry! Use chemical reactions and scientific principles to create mind-blowing tricks. For example, you can demonstrate how different liquids affect the way paper burns using separate beakers of water, ethanol, and a 50/50 ethanol-water mix. This is a simple and engaging way to showcase how chemistry innovates and improves materials, such as fire-resistant ones, making them safer and more effective.

Why not introduce a "mystery liquid" along with water, ethanol, and the mix? Have students guess what the liquid is based on its effect on the paper and how it burns.

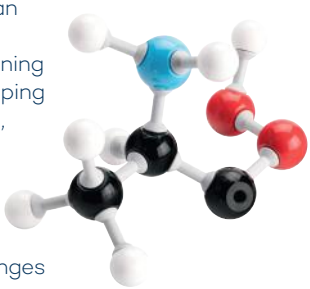


See page 54 for a list of all the products featured.

Rainbow Reactions: Explore the fascinating world of pH changes and acid-base reactions with a vivid and engaging effervescent rainbow. Using hydrochloric acid and sodium carbonate, you'll see vibrant colour shifts as the pH moves from acidic to basic. This hands-on activity not only shows dynamic chemical reactions but also helps students understand the properties of acids and bases. Understanding pH is essential in fields like agriculture, medicine, and environmental science, as it impacts soil health, human health, and water quality – key elements for sustainable development and environmental protection.

Why not add a bit of extra excitement by combining this experiment with a classic baking soda and vinegar volcano? Download our lesson plan and get started!

Molecular Masterminds: A great way to engage students in hands-on learning about molecular structures is to organise team-based challenges where they work together to build complex molecular models based on specific criteria. These challenges can reflect real-world scenarios, like designing new drugs or developing advanced materials, demonstrating how chemistry shapes the future.



Alternatively, set up puzzles or challenges where students use Molymod models to tackle imaginative molecular problems. For example, they might need to create a molecule with particular properties or arrange atoms and bonds in a given space. This approach highlights how creative chemical solutions are driving future innovations.

Competition Time... WIN a MolyMod Teacher's Molecular Model Set*

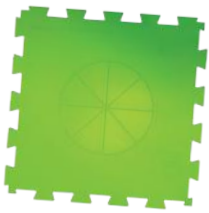
For your chance to win a Teacher's Molecular Model Set (VTN12301958) worth £38.00 simply answer the following chemistry-related question.

Q: What substance is made up of 6x Carbon atoms, 12x Hydrogen atoms and 6x Oxygen atoms?

Send in your answer along with your name and details to **win@vittaeducation.com**

Good luck!

Black Snake: This visually captivating experiment that resembles a "snake" emerging from the beaker, offers a hands-on opportunity for students to see and take part in a fascinating chemical reaction. By combining sugar and sulfuric acid, students witness an exothermic reaction that vividly demonstrates key chemical principles, such as energy transfer and safety protocols. As students observe how energy shifts during the reaction, they gain insights into real-world applications like energy production and technological advancements. Additionally, the experiment highlights the importance of safety and proper waste disposal.



Get Involved!

Share how you will be celebrating Chemistry Week in November – tag the Royal Society of Chemistry on social media and use hashtag **#ChemistryWeek**

*Enter by 23:59 on 27/10/24 for your chance to win.

WELCOME TO BLADES BIOLOGICAL

The home of sustainable specimens

Established by Philip Blades in 1986, we are a small team who have been collecting and sourcing a variety of biological specimens and equipment and are committed to providing a professional and personal service. Here at Blades, we are committed to sustainability — not only the sustainability of our business but also the land and wildlife around us.

We're extremely fortunate to be based in the beautiful Kent countryside and have been at our current location for over 25 years. We try to use as many recycled and reusable materials as possible, and we reuse boxes and shred our own papers for packaging.

Our pond life is grown in natural and man-made ponds on our grounds, which means we can ensure they are never overused and depleted.

A wide range of microbiological living organisms and equipment is readily available to help expand knowledge and understanding of the natural world.

Our frozen specimens, along with our extensive collection of preserved specimens, are ideal for hands-on teaching of anatomy.

In January 2024, we became **CAROLINA'S SOLE UK DISTRIBUTOR**. We now have full access to their extensive range of scientific resources, including a vast selection of microscope slides and sets.

We are able to source a wide variety of biological products that may not be in our catalogue or online; please enquire if you have any specific requirements.

NEW CATALOGUE OUT NOW!

To get your copy, please email **sales@blades-bio.co.uk** with your name and address, and we'll pop one in the post to you.

You are now also able to follow us on social media... Find us on Facebook and Instagram: **Blades Biological**

Blades Biological Ltd

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HERE TO HELP...

Stuck with science? We've got your questions answered with a little help from our resident science guru, Primrose Kitten

Do you have any tips for creating a collaborative learning environment in our science classroom during the first term?

Implement collaborative learning strategies like Think-Pair-Share, where students first think about a question individually and then discuss with a partner before sharing them with the class.

Encourage peer teaching. This builds confidence and reinforces their understanding of the subject matter. Establish classroom norms that promote respect, listening, and constructive feedback to ensure all voices are heard and valued.

Could you suggest practical ways to incorporate sustainability and environmental topics into science lessons?

Incorporating sustainability and environmental topics into your lessons can engage students with real-world issues and foster environmental responsibility. Begin by integrating sustainability into everyday lessons, such as exploring the carbon cycle in biology or discussing renewable energy sources in physics.

Host a Green Week where each day focuses on a different sustainability topic, such as recycling, energy conservation, and biodiversity. You could arrange field trips to local nature reserves or recycling centres, allowing students to see sustainability efforts.

Incorporate sustainability-focused experiments, like measuring the impact of acid rain on plants or investigating the efficiency of different insulation materials in physics.

Incorporate current events by discussing recent environmental news and policies, encouraging students to think critically about global issues. Create cross-curricular links by collaborating with geography or citizenship classes to explore sustainability's social and economic aspects.

How can we make learning about the water cycle more interactive and understandable for Key Stage 2?

Hands-on activities and relatable examples are the cornerstone for making any activity more engaging. Start by introducing the basic concepts through storytelling, using a character like "Walter the Water Droplet" to travel through the stages of the water cycle.

Create a simple, interactive model of the water cycle using a plastic container, a small cup, and a heat source like a lamp to simulate evaporation and condensation. Students can observe how water evaporates, condenses, and returns as precipitation, visualising the process first-hand.

Incorporate technology using educational videos and interactive apps that illustrate the water cycle and utilise visual aids like diagrams and posters that students can create themselves.

Finally, relate the water cycle to local weather patterns and environmental conditions, encouraging students to observe and record weather data over time to see how the cycle impacts their environment.

What are effective strategies for teaching the concepts of periodicity and trends in the periodic table to Year 11?

Start by contextualising the periodic table's historical development, explaining how it was organised and the logic behind its structure.

Use interactive periodic table apps and software that allow students to visualise trends such as atomic radius, electronegativity, and ionisation energy. These tools often provide dynamic visuals that make abstract concepts more tangible.

Facilitate group discussions on why elements exhibit certain behaviours based on their position in the periodic table. Encourage students to predict properties of unknown elements by analysing trends, reinforcing their understanding of periodicity.

Got a question to ask?

Send in your science queries for Primrose Kitten to answer each term. Email **hello@vittaeducation.com**

DEVELOPING CORE SCIENTIFIC SKILLS

Getting better at the basics with My Science Club

Science is more like baking than cooking – in cooking you can get away with a dash of this and a splash of that, whereas baking requires a much higher degree of accuracy of measurements, cooking temperatures and timing to get perfect results.

Science, by its nature, needs to be very precise. From materials scientists ensuring the heat shield layers of the JWST are all exactly 0.05mm thick, to a paleontologist painstakingly cleaning a large skull with a paintbrush, scientists have to be able to work accurately. The need for incredible accuracy extends beyond that as well, the 2024 Olympic 100m finalists were separated by 0.12 seconds and the gold and silver winners ran exactly the same time, the timing technology needs to be accurate enough to separate the athletes.

As a former research biochemist one of the first core skills I had to learn in the lab was to be able to measure very accurately. Whether it was measuring out a few milligrams of a solid on a balance, or a couple of microlitres of a solution with a pipette, it had to be accurate. It also had to be reported accurately so that the procedures I was developing could be repeated, with exactly the same results, by someone else, every time.

So, to teaching science in school. How much do we focus on accuracy during practical work? Do we take the time to teach pupils vital core scientific skills around measuring, using instruments, data collection and recording?

I think that by upper primary school, and through secondary school, we should be getting away from 'Kitchen' science and moving more towards 'Laboratory' science. Instead of using 'a teaspoon of...', or 'a cup of...', or 'a few cm's of...' we should be teaching pupils to be accurate in their work. Increased accuracy leads to repeatability of results and a better understanding of the underlying scientific concepts.

MEASURING

Wherever applicable include specified measurements in instructions and give pupils plenty of opportunities to practice measuring in different contexts. It could be accurately measuring a 10cm square of material to insulate a tube, or measuring out exactly 50mls of water and 5g of citric acid to make a solution. For younger pupils use larger volumes, masses and distances as these are easier to measure. As pupils' progress, and have access to more accurate equipment, they will be confident to measure smaller weights, volumes and distances more accurately.

USING INSTRUMENTS

Introducing pupils to scientific instruments early, and giving them lots of opportunities to practice using them, is important. Measuring liquids with a beaker, or solids with a digital balance can be built in to a wide variety of activities. If you're planting seeds specify the mass of soil to be added to the pot and the volume of water to be added, you could even specify the depth that the seed needs to be buried at.

Giving pupils opportunities to use thermometers, stopwatches and tape measures in different contexts lets them develop core skills that will be used across scientific investigations.

COLLECTING DATA

Pupils need to be given lots of opportunities to collect data from a wide variety of investigations. This means planning investigations that produce a result that can be measured and the data recorded. For example; instead of using lemon batteries to try and light an LED, measure the voltage produced with a volt meter. This lets you investigate what happens if you have more than one lemon, whether limes, or grapefruit, produce a higher voltage than a lemon, or even what the best electrodes to use are.

Using a rain gauge, thermometer and anemometer to take daily weather readings lets pupils

Authors: Bryony Turford and Paul Tyler. Co-founders of My Science Club.

explore how weather changes across a day, and from day to day by comparing data points – rather than observations.

PRESENTING DATA

Alongside learning how to collect data using different instruments pupils need to be taught how to organise the data into a table. Constructing tables to collect data is a core skill that is often neglected as pupils are given pre-printed tables to use. Talk through the thought processes for designing a table with them, identifying the constants and the variables to be recorded. Ensure they practice repeating results, to make them more reliable, and calculating averages from them – older pupils can be shown how to discard outliers, if there has been a data collection error.

The final core skill is graphing, which helps pupils draw conclusions from their data. Pupils should be taught to hand-draw graphs before being shown how to create them digitally – this ensures that the core skills are understood properly.

ALWAYS IN YOUR CORNER

Get the backing you deserve this term with VITTA

As we kick off our second academic year as VITTA Education, we're excited to share the latest updates and developments with you. Our commitment to your satisfaction remains unwavering, and we're thrilled to report that our customer satisfaction rate stands at an impressive **89%**†. Your feedback means a lot to us, and we're dedicated to continually enhancing our offerings and raising the bar.

We've been busy enhancing not only our product offering with new brands and ranges but also your online experience. Our website now features a richer selection of resources, including updated chemical safety data sheets, more downloadable lessons and practical content, and detailed product information such as manuals, certifications, and brochures.

Be sure to check out the **Offers & Resources** section† on our website. It's packed with valuable materials, including our expanding catalogue of chemical recipes and required practicals. We've also added a new range of lesson plans and teaching ideas designed to bring dry topics to life and make the everyday more engaging and efficient.

Additionally, we are excited to introduce our new **Science Essentials Catalogue**, which was launched towards the end of the Summer Term. Available both digitally and in print, this catalogue, curated by our technicians, features our best-selling and most popular products. Explore the full range online at **vittaeducation.com**.

Should you have specific needs, require bulk purchases, or seek recommendations, our friendly team is ready to assist you.

In response to your feedback from our T Level Thursday virtual lab tour and Q&A session, we recently hosted an **Industry Insights Day** at Test Labs, our sister company. This UKAS-accredited medical device testing laboratory, in partnership with the Education and Training Foundation, provided attendees with valuable insights and real-world context to enrich T Level teaching. We look forward to organising more insight days and collaborative sessions for T Levels and other science qualifications.

We're also launching the second edition of our **T Level Science Handbook** this term. This updated resource is designed to address the questions and concerns raised by schools and colleges on their T Level journey, offering even more insights, case studies, and essential equipment details. You can get your copy by visiting **vittaeducation.com/T-Levels.**

Our dedication to meeting and exceeding your needs is further demonstrated through our **VITTA product review programme**. Over 50 dedicated educators are providing honest feedback on our latest products, helping us refine our offerings based on your input.

Finally, we're excited to continue our **VITTA Science Savers** throughout the Autumn Term. Help maximise your budget with offers such as free products and bulk discounts on essential science supplies. Feel free to reach out if you have any questions or need assistance.

We're looking forward to another great year together, supporting the scientists of tomorrow. At VITTA Education, we're always here to deliver innovative solutions and exceptional service to meet your educational needs. Thank you!

†Average customer satisfaction score August 2024.

KEEP ON TOP OF THE LATEST VITTA NEWS

Sign up to our monthly newsletter for all the latest product, sector and VITTA news – in your inbox and at your fingertips! Plus, if you haven't already, you'll get **5% OFF** your next purchase** as a thank you. Don't miss out, sign up today at **vittaeducation.com/newsletter**

DON'T MISS OUT!

We love giving you the best deal we can on your science supplies, so when there's an offer or promotion running do remember to let your finance department know about it before they order. From free delivery codes, free sweets and more, don't let a good deal go to waste!

TECH'S TIPS FOR THE TERM...

My dear biology teacher asked me if we could dissect brains for a summer medicine school. As a chemist by nature and physicist by daylight, my brain went a mile a minute. My first thought was... that's going to be so awesome for the students to see and dissect. The idea of dissecting a brain fascinated me, so the first port of call... what would CLEAPPS do? Recently, CLEAPPS made a gorgeous flowchart (GL435), pooling all their dissection resources in one place. This, in addition to their GL309 guide, was a helpful read and gave me the head start that I needed to prep for the practical. I ordered veal brains from Samples for Schools, which arrived well-sealed and in a cute tidy little plastic tray.

I assumed that the shape of the brain would remain as it was in the plastic tray. To my surprise (in all the excitement of seeing raw brains for the first time, I forgot that GL309 mentions this...), when I picked up the brain, it started to slide down through the spaces between my fingers and almost plopped into the sink. I thought I'd open the packet over the sink ready to wash it, which luckily I did, as I found out that washing the brain is a good idea. I discovered blood clots, bone fragments, hair, and general fatty mush.

Realising that the students would have a difficult time dissecting this as it was too slimy, I remembered that GL309 mentions that if you cook the brains, it makes for a better experience during dissection. I immediately grabbed my 1-litre thick-walled Pyrex beaker and set it up for boiling water on a Bunsen burner. Following GL309's advice of "simmering in a pan of water for 10-15 minutes..." I slipped the brain into the beaker and started the boil.

Holding my breath nervously, I waited for my teacher to call me during the practical to show me the internal results. Behold, in front of me, a student had perfectly bisected the brain along the medial longitudinal fissure to reveal the ventricles and the cauliflower-looking Arbor Vitae. On one of the hemispheres, the frontal lobe was cut to reveal the white and grey matter. All the features were very obvious as the cooking process had coloured different parts and strengthened the structures. I was very happy. The teacher was happy. And the chef was bewildered by what he had just done. A lesson was learnt... **Always cook your brains!**

Thanks to Shamim Alom BSc, MRES, Science Technician at Queen's Gate School, London for sharing his tips... if you have a great tip to share, send an email to **tips@vittaeducation.com**

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THANK YOU FOR BEING A VITTA READER!

As always, we are eager to enhance your experience, and your feedback is crucial in keeping our magazine fresh, insightful and valuable to you. The Autumn Term issue is a testament to our commitment to delivering engaging and insightful STEM education content.

We would greatly appreciate your thoughts and opinions on the articles, features, and overall design. Your feedback will not only help us understand what resonates with you but also guide us in shaping future editions to better meet your interests.

Whether it's constructive criticism, suggestions for improvement, or even compliments on what you enjoyed, your insights are invaluable to us. Thank you!

We look forward to hearing from you. Please go-ahead and **scan the QR Code** to submit your feedback.

TAKE A BREAK & WIN!

Find the missing word for a chance to **WIN 1 OF 3 BeeSpi V LIGHT GATES**

Take a look through our Autumn Term wordsearch and find the missing word from the list below. Take a pic and email your answers back to **win@vittaeducation.com**

Entries close 31/12/24. Terms apply. See website for full details.

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Search for the missing word...

Autumn	Chromosomes	Environment	Human	Rewards
Biology	Constellation	Experiment	LaBLiFe	Rocket
Catalyst	Development	Genetics	PASCO	Satellite
Chemicals	Dissection	Gingerbread	Physics	Space
Chemistry	DuraLab	Halloween	Reaction	Technician

MISSING WORD:

Well done to our Summer Term winners: Amy Purdon, Janice Bennett, Sarah Peak, Barry Phillips and Achini Dharmasena.

PRODUCT index

Seen something that would look great in your prep-room or department? Listed below you'll find all names and codes for the products shown throughout this Autumn Term magazine.

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5, 42	DuraLab DF-100 Classic Mono Microscope	DRL0039
5	DuraLab DP-3002 Advanced Precision Balance – 3000g x 0.01g	DRL0049
8	PASCO Wireless pH Sensor	PS-3204
15, 52	EduLab Microscience Titration Kit	VTN12302008
19	Lascells Gravity Well	VTN12302112
19	GeoSafari Motorised Solar System	VTN12302109
35	Becelec 2 Electric Burner	VTN12301369
37, 48 & 52	DuraLab DP-1002 Advanced Precision Balance – 1000g x 0.01g	DRL0048
37	EduLab Moss Safari Explorer Workbook	ELB0001
37	EduLab Moss Safari Kit for KS 2-3	VTT12307061
37	PASCO Photosynthesis Chamber	PS-3251
39	DuraLab DX-830 Pro Trinocular Microscope	DRL0046
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42	DuraLab DP-3002 Advanced Precision Balance – 3000g x 0.01g	DRL0049
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43	Black Marabou Feather Duster	ZFK070040
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43	EduLab DNA Forensics Lab Investigation	VTN12301704
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