AMGEN® Biotech Experience

Scientific Discovery for the Classroom

United Kingdom

Amgen Biotech Experience programme

Industry professionals in the Health and Science sectors supporting teachers with curriculum delivery

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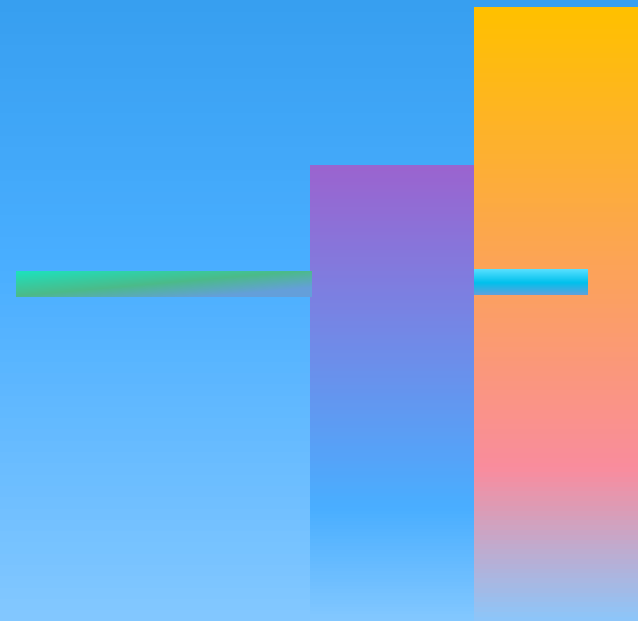


Industry Context: Biotechnology

Human health products and Agriculture and food-enhancement products are part of the Biotechnology industry in the United Kingdom.

The market size of the Biotechnology industry in the United Kingdom is £25.3bn in 2026, with a growing number of businesses (~3K).

The biggest companies operating in the Biotechnology industry in the United Kingdom are Amgen Ltd and Takeda UK Ltd. Many SME.’s

Biotech Hubs & Science Parks

The UK has an advanced pharma industry with over 700 pharmaceutical companies in the UK providing 70,000 jobs. The industry generated a turnover of £36.7 billion, import of £21.4 billion and export of £23.4 billion (Source: ABPI). London, North West of England and the M4 corridor (London to South Wales) are the location with the highest number of pharmaceutical companies in the UK.

Funding & Delivery

Amgen Inc.
Global biotechnology company, present in >100 countries, employing >23K employees

Amgen Foundation's mission is to advance science education, inspire the next generation of innovators, and invest in strengthening communities where Amgen staff live and work.

Amgen Biotech Experience (ABE) - empowers high school teachers to transform their classrooms into biotechnology labs through professional development courses, teaching materials and research-grade lab equipment in 17 countries, all at no cost to participating schools.

Sponsor of **Khan Academy**'s multilingual biology resources, ranging from 9th grade biology content through to Advanced Placement® (AP) Biology.

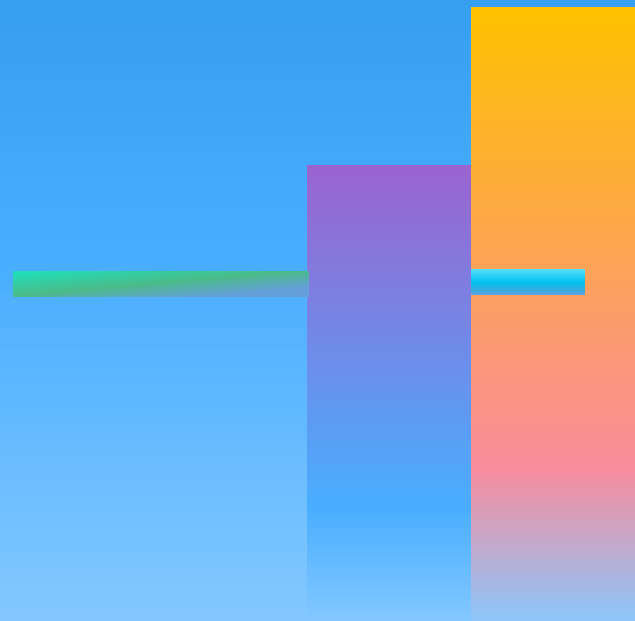
Amgen Scholars enables undergraduates from many colleges and universities to experience life as scientists with top academic researchers at premier institutions around the world.

LabXchange is a free, online platform providing access to personalized instruction, virtual lab experiences and networking opportunities across the global scientific community.

The Amgen Biotech Experience

Biotechnology underpins modern pharmaceutical research and provides a strong industry context for T Level Science. Through the Amgen Biotech Experience (ABE), students can explore how biotechnology therapies are developed while building practical skills and professional behaviours.

The programme is designed to be applied and accessible, supporting teachers, technicians and students with the resources and CPD needed to deliver biotechnology using industry standard kit and approaches.



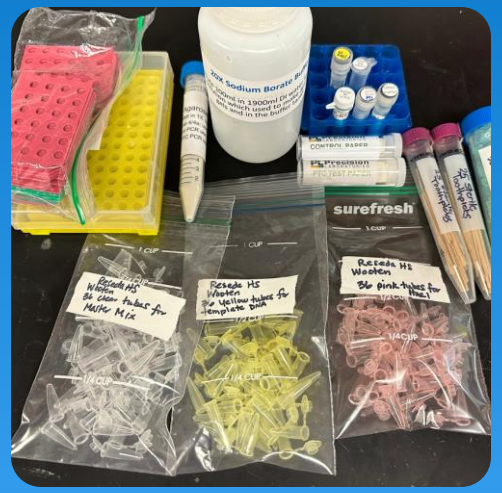
ABE brings brings critical hands-on biotechnology learning experiences into classrooms in the UK:

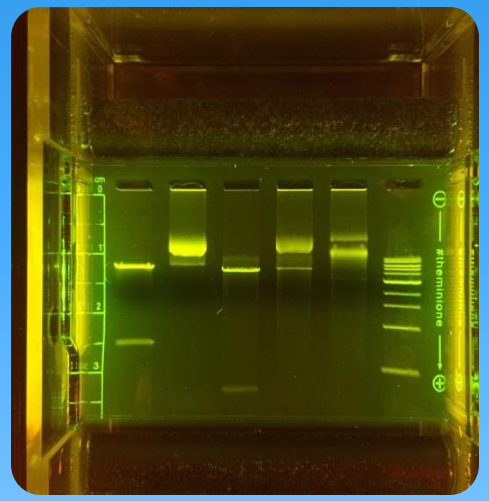
- Laboratory-based biotechnology curriculum
- Free to secondary schools and colleges
- Free professional development for teachers and technicians
- Loan of research-grade equipment with supplies
- Extensive teacher support
- Regular network meetings

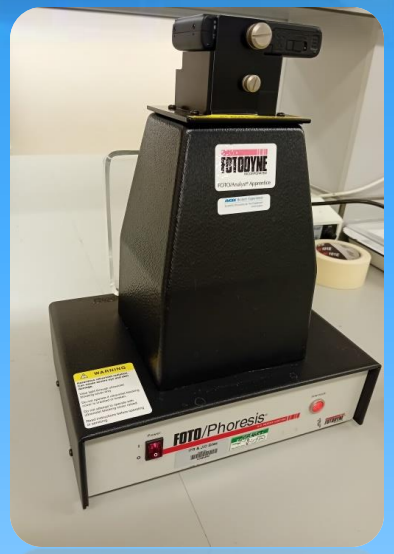
Programme relevance

- Fosters interest in **scientific careers**
- Develops **scientific understanding** for all
- Immerses students in the concepts and skills used in **medicine development**

ABE equipment and materials







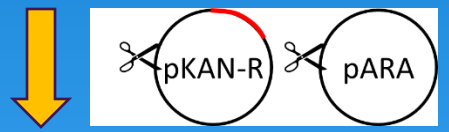
Curriculum relevance

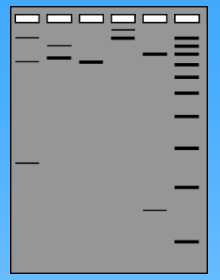
Curriculum adapted for the UK, addressing both **scientific literacy** and **practical skill development**

Scientific literacy

- DNA Profiling
- Gene Cloning
- GM Crops
- Inheritance
- Personalised medicine

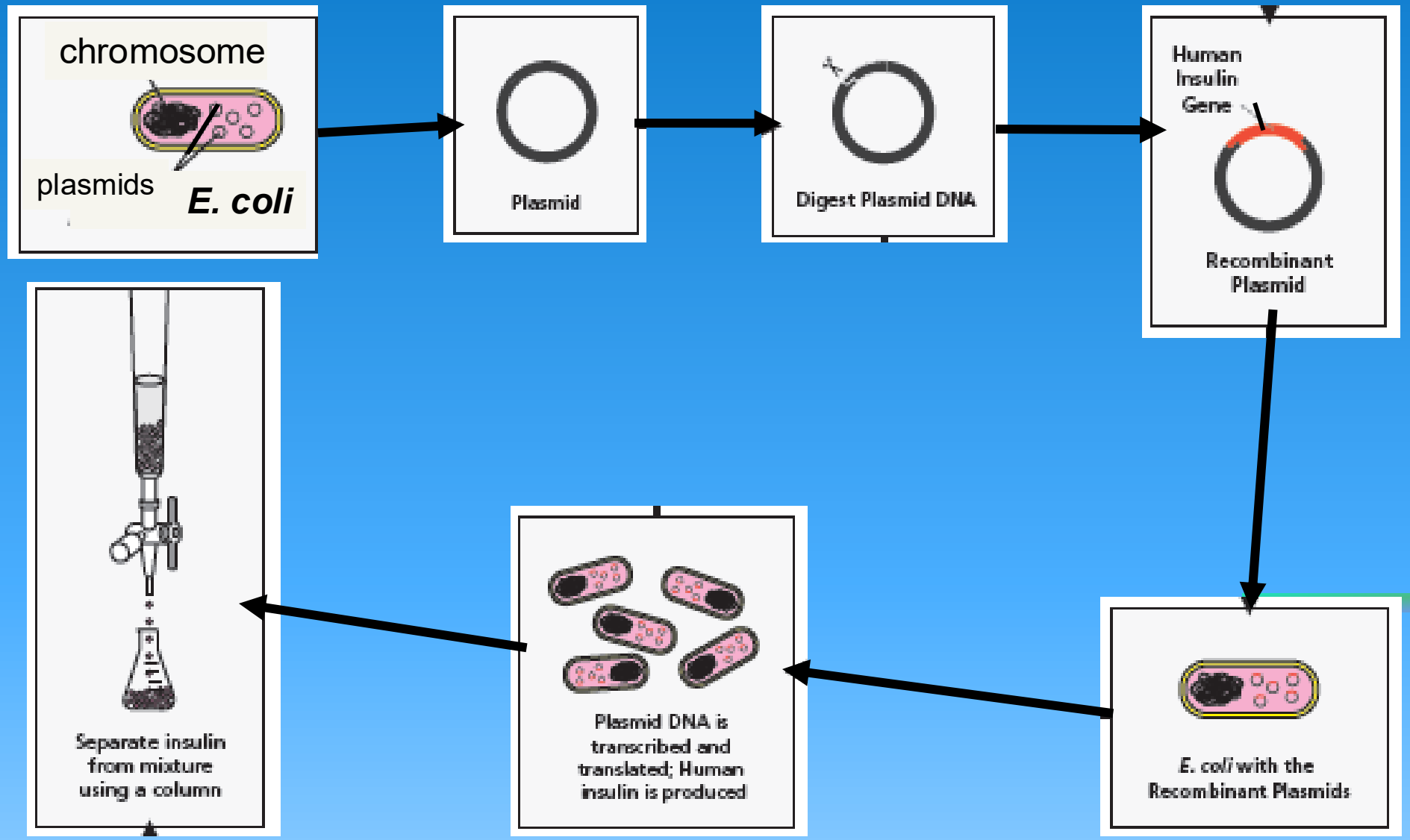
Lab 2 Restriction digestion





Lab 6 Bacterial transformation

MAKING PROTEIN THERAPEUTICS



Kit loan and professional development

5 hubs, providing **free kit loan** for 2-3 weeks and **free CPD to teachers and technicians**

UK hubs are located in Cambridge, Hatfield, Hull, Norwich and Kent

2024/5 impact – teachers, technicians & students reached

Hatfield – **58** teachers and technicians across **29** schools in 12 districts, 3,346 students.

Norwich - **20** teachers and technicians across 10 schools in **2** districts, 602 students.

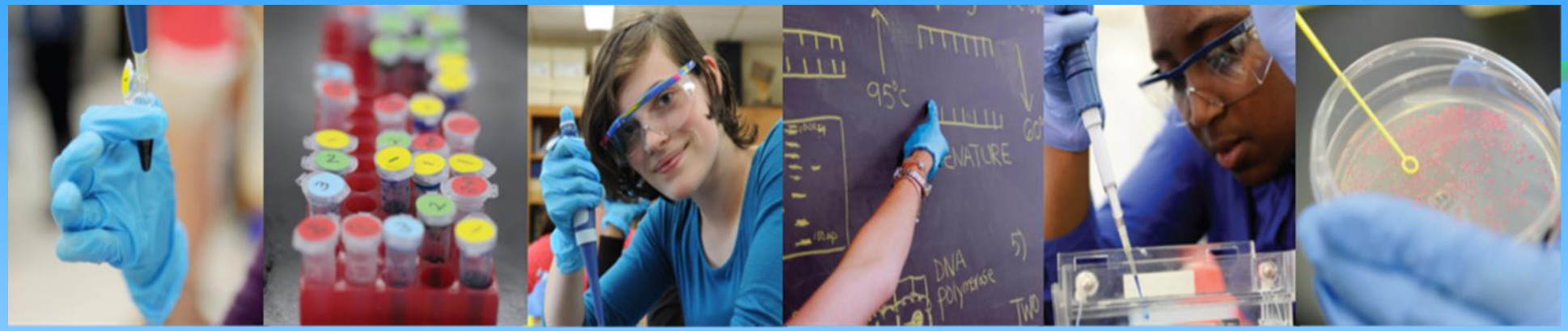
Kent – new hub – **24** teachers and technicians attended CPD this year.

Cambridge - 28 teachers and technicians across **14** schools in 6 districts, 892 students.

Hull - **16** teachers and technicians across 8 schools in 6 districts, 697 students.

Teachers and technicians reached since inception: 571

Students in 2024/25 academic year: 5,537



How the Amgen Biotech Experience kit supports T Level science students in developing industry-ready skills

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Development of core laboratory techniques

The kit provides structured activities in pipetting, sample measurement and data analysis – key competencies pivotal to technical courses and professional science roles.

These methods mimic the role of standard operating procedures - a central theme of T Level Science.

ABE labs can be used to deliver and assess core A content:

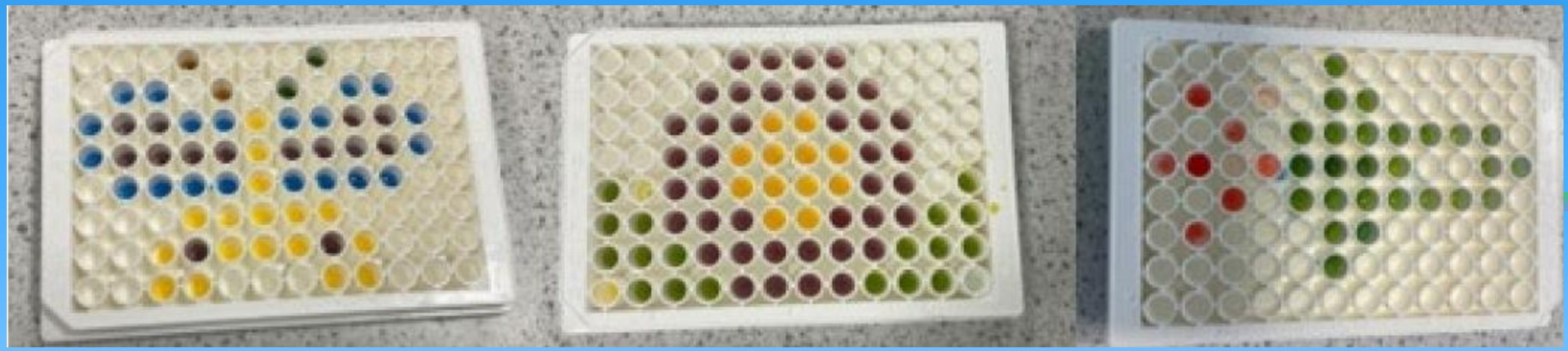
- A3=A4 health, safety, environmental practices: risk assessment, aseptic technique, correct use of PPE, waste disposal and safe handling of biological materials and reagents.
- A5–A6 managing information, data handling and processing: recording raw data and drawing conclusions from biotech experiments.
- A8 good scientific and clinical practice
- A9 scientific methodology
- A10 experimental equipment and techniques: planning investigations, following SOP-style protocols, calibrating and using micropipettes, incubators and electrophoresis apparatus and evaluating reliability and validity.

ABE labs can be used to deliver and assess core B content:

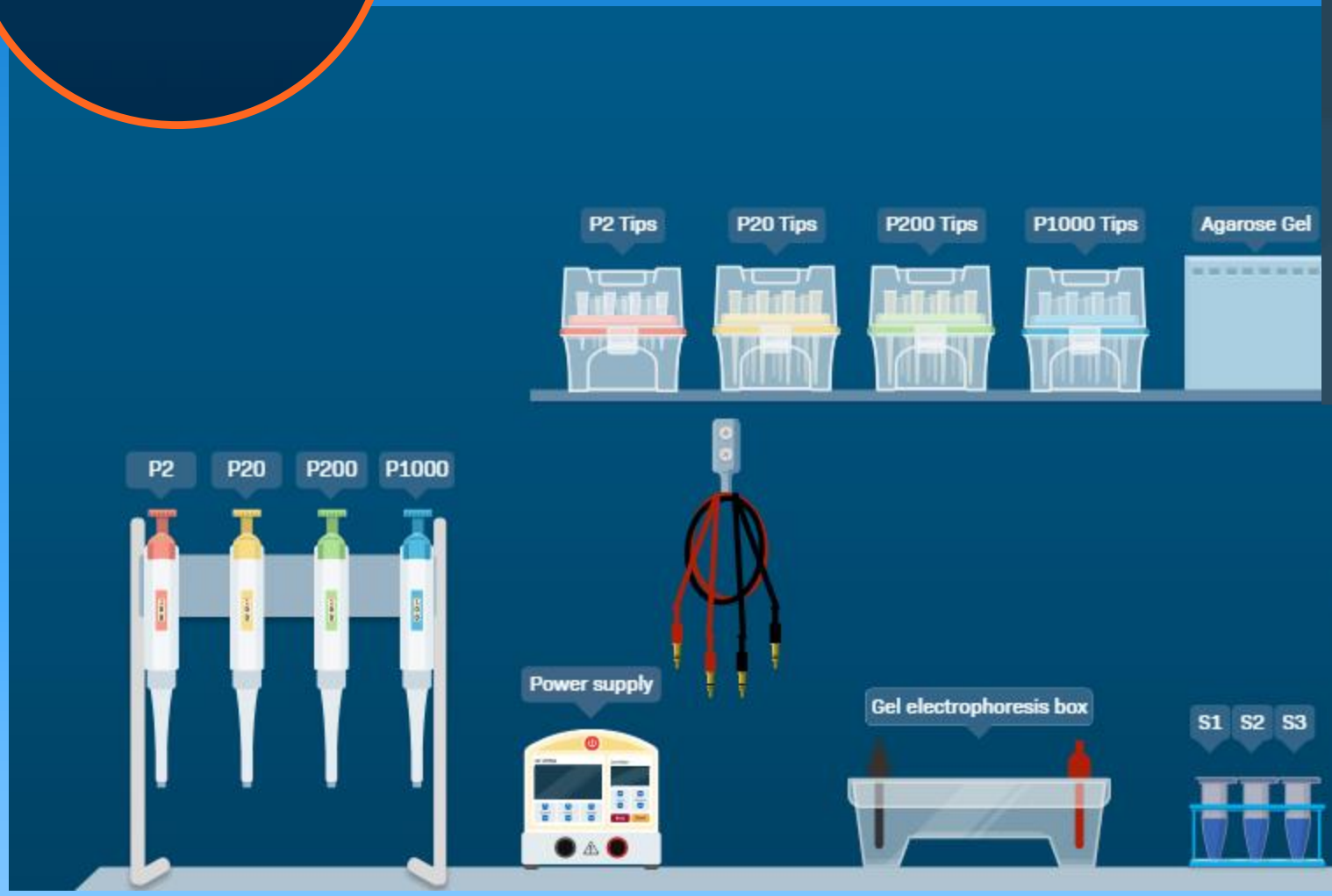
- B1 Biology content: structure and function of cells; large biological molecules (DNA, proteins, enzymes); genetics and genetic information; microbiology and pathogens; enzymes and protein structure; cell cycle elements relevant to transformation and cloning and aspects of immunology when discussing biotech applications such as biologic drugs.

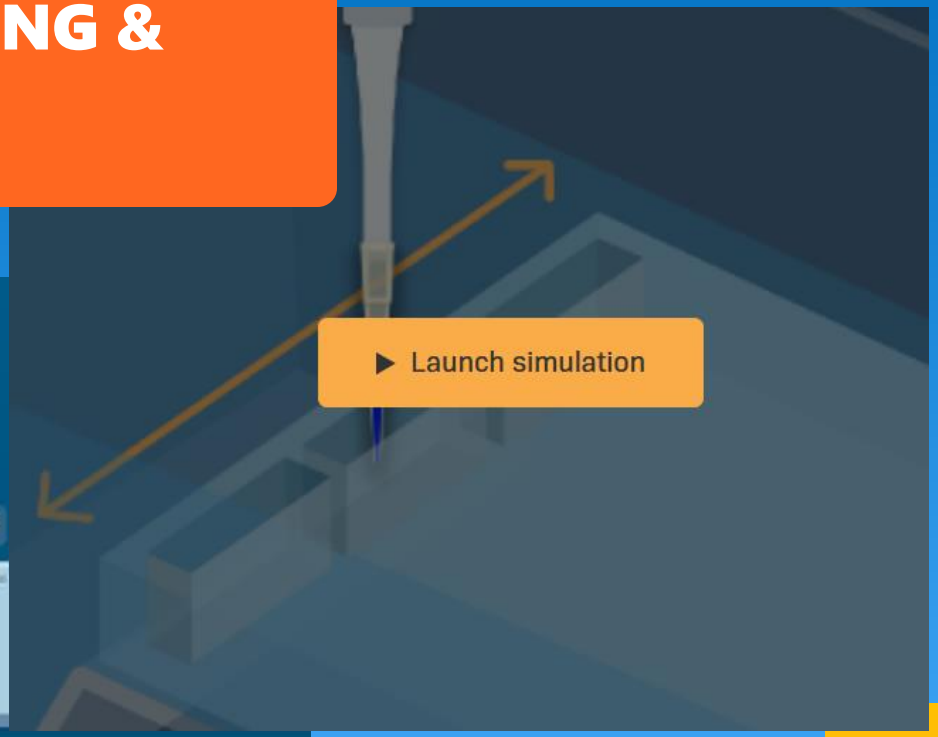
- B2 Further scientific concepts: extension of core genetics and molecular biology into applications such as recombinant protein production, gene expression and analysis and industrial/medical biotechnology

Curriculum & Resources



ABE PROFESSIONAL LEARNING & LABXCHANGE





Hands-on molecular biology methods

Activities such as aseptic technique, restriction digests, cloning, PCR and gel electrophoresis give students real-world experience with widely-used molecular biology techniques, closely mirroring those used in industry laboratories.

Accuracy and precision

Students engage in equipment calibration and reflection on error sources, establishing best practices for laboratory work. They learn to implement the continuous improvement cycle through project work within the T Level curriculum. Ultimately these competencies are assessed though the occupational specialism exams.

Peer evaluation and skill tracking

More experienced students, returning from industrial placement, can support others through peer evaluation, with progress recorded toward the Science Council T Level Competence log.

This scaffolds development toward professional registration for science technicians in the UK.

Science Council

T LEVEL SCIENCE PROFESSIONAL COMPETENCE LOG

By choosing to study T Level Science you are on your way to developing the knowledge, skills and behaviours required for a career in science.

WHAT IS PROFESSIONAL REGISTRATION?

The Science Council recognises excellence in the practice of science by awarding Registered Science Technician (RSciTech) to experienced technical scientists. The RSciTech professional award has been developed to incorporate the key professional attributes valued by employers; it is a quality mark that demonstrates commitment to the highest standards in the practice of science.

WHAT ARE THE BENEFITS OF PROFESSIONAL REGISTRATION?

- ✓ Recognise your experience, expertise, and commitment in your chosen scientific field of practice.
- ✓ Provide connections to a broad community and network of scientists, working in a variety of disciplines.
- ✓ Help to plan and progress your future career, with a structured framework for goal setting.
- ✓ Showcase your dedication to upholding professional standards to employers, colleagues, and clients.

“I achieved my RSciTech award in January 2021 and to know that I have been deemed competent against an international standard for scientists by a professional body is amazing! It has boosted my confidence in myself and my work and it's also reassuring for my colleagues to know that they can trust me to deliver work to

HOW WILL THE T LEVEL PROFESSIONAL COMPETENCE LOG HELP YOU?

Completing this document as you go through your T Level will give you a head start on your path towards RSciTech by increasing your understanding of the competences and the types of evidence required. This record of your professional development will also help you to stand out when you're applying for a job, apprenticeship, or further study, as you will be able to use the examples recorded here as you prepare to take your next steps.

The table overleaf sets out the competences that are required for the award of RSciTech, which you may be eligible to apply for after

Competence (examples of evidence below table)		Task/Activity (experience from lessons/Industry Work Placement)	Role played (personal contribution made to the task or activity)
A Application of knowledge and understanding	**A1:** Apply knowledge of underlying concepts and principles associated with area of work.		
	A2: Review and select appropriate scientific techniques, procedures and methods to undertake tasks.		
	A3: Interpret and evaluate data and make sound judgements in relation to scientific concepts.		
B Personal responsibility	**B1:** Work consistently and effectively with minimal supervision to appropriate standards and protocols and know when to escalate appropriately.		
	B2: Demonstrate how you apply safe working practices.		

Occupational specialism coverage

T Level Laboratory Sciences requirement	ABE coverage
PO1: Perform a range of appropriate scientific techniques to collect experimental data in a laboratory setting, complying with regulations and requirements	Follow detailed protocols, use micropipettes and other lab equipment accurately, work aseptically with microorganisms or DNA and record primary data from gels, cultures and assays.
PO2: Plan, review, implement and suggest improvements to scientific tasks relevant to a laboratory setting	Plan work across multiple sessions, adapt protocols (e.g. volumes, incubation times), reflect on yields/bands/colonies and propose realistic improvements to method and controls.
PO3: Identify and resolve issues with scientific equipment or data errors	Troubleshooting of gels, transformations and pipetting, encouraging diagnosis of equipment mis-use, contamination or calculation errors and evidencing corrective actions.

Support for SEND students and transition to industry

Students with special educational needs and disabilities (SEND) can spend significant placement hours with technicians on qualification-relevant tasks, easing their transition to industry placements and building their confidence for future careers.

Next steps & online resources available

Contact **stem@herts.ac.uk** to ask any questions and to sign up for the UK ABE newsletter

Visit **go.herts.ac.uk/amgen** and complete the **registration of interest form** to find out about participating

Hubs in Cambridge, Hatfield, Hull,Norwich and Kent

www.labXchange.org