

## Practical science with Cambridge International

Cambridge Assessment International Education provides some of the best science education in the world. We are part of the University of Cambridge – the birthplace of scientific discoveries such as the laws of gravity, the electron and the structure of DNA. We believe that practical science is a fundamental component of providing excellent science education, and that formal assessment improves classroom practice.

### The importance of practical science assessment

Universities want to see evidence that a student has undertaken practical work during their science studies at school. We believe that the best preparation for university study is to support practical science throughout a student's pathway, from Cambridge IGCSE™ to Cambridge International AS & A Level. This gives students the practical experience that universities value so highly.

The formal assessment of practical science skills delivers both immediate and long-term benefits:

- Science is a practical subject and research<sup>1</sup> suggests that **success in future scientific study, or a scientific career, requires good practical skills.**
- When considering applications to science degree courses, **universities want to see practical experience** as well as theoretical understanding.
- Students with proven practical science skills are **best placed** to apply to such courses, especially at the **most prestigious institutions**, and to do well in their undergraduate studies.
- Practical skills **improve understanding** of the principles of scientific enquiry and of scientific theory.
- Practical science can be one of the most **exciting and interesting** elements of a science course, sparking curiosity and engagement and improving understanding. From a teacher's perspective, the motivational value of practical science can play a vital role in improving student performance across the class.



- Many of the specific skills gained through practical science experience, such as accurate measurement and observation, or the value of perseverance, are shown to support progress in many other courses of study or employment routes.
- As practical science is often a group activity, it can also encourage lifelong skills that are highly relevant to other subjects and career paths, such as **team working, collaboration** and **communication skills.**

### The Cambridge approach

Our work is informed by research and underpinned by over 150 years of experience. We believe that education works best when curriculum, teaching, learning and assessment are closely aligned. That belief inspires the design of all aspects of Cambridge programmes, including our science provision.

“ Cambridge International AS Level science practicals have given students a head start at university, as the students who have been exposed to other syllabi have never had a chance to work with laboratory equipment or chemicals. ”

Bronwyn Crichton, Head of Department – Science, Lonehill Academy, Johannesburg, South Africa

<sup>1</sup> [www.gatsby.org.uk/uploads/education/reports/pdf/good-practical-science-report.pdf](http://www.gatsby.org.uk/uploads/education/reports/pdf/good-practical-science-report.pdf)

### Studying science with Cambridge International

Cambridge sciences are available in a wide range of subjects and options at Cambridge IGCSE™, Cambridge O Level or Cambridge International AS & A Level. Students can study individual science subjects, or for IGCSE or O Level choose a coordinated syllabus.

#### Theoretical and practical learning combined

Syllabuses combine theoretical and practical learning to provide a solid foundation for university or employment.

#### Practical skills

Universities want to see evidence that a student has undertaken practical work during their science studies at school. Our assessments support students to be in the best position to apply to the university of their choice.

#### Delivering practical assessments

Schools can choose between a practical test and, in the case of Cambridge IGCSE and Cambridge O Level, an alternative to the practical exam – a written paper. Schools without the equipment or space for all learners to take a practical exam at the same time can arrange multiple exam sessions on the same day.



“ When studying Cambridge International A Level Chemistry I found everything really interesting, especially the practical. I'm a very visual learner, so going into a laboratory gives you a vision of what you're trying to study instead of thinking of the subject as just numbers and chemical reactions. ”

Sivali Wahab, former student, Jubilee School, Jakarta, Indonesia, now Enterprise Services Engineer, Techneaux Technology Services, Louisiana, US

### Frequently asked questions

#### Why do some schools opt for science qualifications that do not emphasise practical science?

Some schools may not have the laboratory resources required or may not employ teachers with practical science skills. Some educators are also concerned that if practical science teaching is too structured – reduced, in effect to following a list of instructions – then it can be both uninspiring and a poor indicator of student ability. These concerns can be addressed by modest investment in facilities and staff, and by offering well-respected, well-recognised, learner-led scientific courses designed to stimulate student engagement and differentiate student performance.

#### If a student does not plan to study science at university, why should they follow a course that includes science practicals?

Practical science should be exciting and memorable. It greatly improves understanding of scientific concepts and develops skills relevant to all subjects, such as critical thinking and problem solving, working in a team and communicating with peers. Students may also change their plans after experiencing practical science, expanding horizons and potentially leading to rewarding future careers.

“ Fundamentally, science is a practical discipline and, by undertaking good practical science at school, one gains a sense of what working in a science-related occupation might actually involve. ”

Lord Sainsbury of Turville, quoted in *Good Practical Science*, The Gatsby Charitable Foundation

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