AQA

A-LEVEL

Biology, Chemistry and Physics

Practical Skills Endorsement – Cycle 3 2019-2021
Executive Summary

October 2020 – interim insight document to support CPAC assessment during Covid-19 restrictions

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A-level Science Practical Skills endorsement requirements for Summer 2021 entries

In order to be awarded a Pass endorsement of GCE science practical skills, a student must consistently and routinely meet the standard expected of each of the Common Practical Assessment Criteria (CPAC) by the end of the course. A student may demonstrate the CPAC in any practical activity undertaken during the course of study. Students may undertake practical activities in groups; however, the evidence generated by each student must demonstrate that they have independently met the criteria.

AQA first published mandatory Lead teacher training materials in September 2015. The latest version of the training materials was published online in September 2020, to include a written transcript to accompany original film clips chosen to demonstrate the Pass standard. There are also a range of resources on the Teaching Resources webpage to support teachers in their planning, delivery, assessment and tracking of student progress. Resources have also been evaluated and amended as appropriate since they were first published. More clarity has been provided in areas which teachers have requested support over the last five years; the AQA technician adviser continues to directly support teachers and technicians to manage required practical work delivery.

This document has been written to support teachers in their delivery of A-level Science practical work and required assessment of Common Practical Assessment Criteria (CPAC) throughout academic year 2020-21. Ofqual consulted on proposals for changes to exams and assessments for Summer 2021 entry due to the concern from students, their parents, carers and teachers about the recent impact coronavirus (COVID-19) has had on education. Given the disruption and potential for on-going public health safeguards Ofqual developed a package of measures which includes changes to the A-level Science practical skills endorsement. For Summer 2021 entries only, the Ofqual decision made after consultation was to:

Change the requirements for the Practical Endorsement to allow assessment of the Common Practical Assessment Criteria (CPAC) across the minimum number of practical activities required to demonstrate competence. Permit exam boards to monitor centres' application of CPAC by remote means.

In response to these required changes for summer 2021 entries the four awarding organisations (AOs) that offer England A-level Science qualifications prepared some agreed messaging. AQA published a series of communications throughout September 2020, including an update to all A-level Science subject webpages outlining the requirements. For all schools and colleges that are expecting a Cycle 3 monitoring visit during academic 2020-21 an agreed Remote monitoring guidance document was produced by the AOs, signposting how practical work monitors would be working with teachers prior to e-submission of practical endorsement outcomes in May 2021.

Insight work – background and context

During the first few weeks back to school and college this academic year, multiple queries were communicated to AQA from teachers with regards to the Ofqual wording, many requiring clarity around the word “minimum” in the decision statement. There were also significant numbers of queries about whether or not all required Apparatus and Techniques (ATs) in all England A-level Science specifications needed to be experienced through “hands on” practical work. Many teachers are committed to securing the “near normal practical experience” for their current Year 12 and 13 students but needed support to understand exactly what they needed to do and how they could go about this whilst working within Public Health England social bubbles. It was important to reinforce that changes relate to Summer 2021 only so teachers needed to assess CPAC with all students on an A-level Science pathway, even if only in their first year of the course.

AQA hosted a number of online meetings during early October with teachers delivering A-level science practical work to large cohorts of students. Centres in the “Large” category for monitoring purposes (those with >140 A-level students taking at least one science subject) were invited to participate, to discuss the barriers that they were experiencing and to share ideas and solutions they had found to deliver practical work and assess CPAC robustly this academic year. Given the most likely barriers would include a lack of equipment, the required meticulous cleaning or quarantine of equipment, concern about teacher and student interaction when carrying out practical work, and potentially having fewer opportunities to offer practical work to all students, this group was considered to be representative and to be able to provide solutions that the majority of teachers could respond to. In response to the invitation, 36 A-level science teachers (Biology, Chemistry and Physics) representing 26 centres across England worked in focus groups during twilight sessions each day of the week commencing 5th October. CLEAPSS expert safety advice services were paid for to accompany AQA assessment expertise. Discussions provided insight from those teaching upwards of a combined 15,000 Year 12 and 13 students, the largest cohort in a single centre being 436 A-level Chemistry Year 13 students.

Insight work – summary of concern

Many of the concerns being discussed during the online sessions were shared by the majority of teachers. The timing of the Ofqual summer series 2021 consultation decisions had meant, in the absence of fully understood clarity of what was expected for the practical endorsement, that timetabling and accommodation of A-level science students has inadvertently created a barrier to "hands on" practical work on occasion. Teachers in this situation are strongly advised to speak to senior leaders in their centre to discuss work-arounds, to enable requirements for the practical endorsement to be met. Where access to laboratories is not an issue, teachers are often teaching smaller groups of students; sometimes delivery is face-to-face to half the class whilst streaming live to the other half working at home. The obvious knock-on effect is that at least twice as much practical work teaching is worrying and, when coupled with the need for meticulous cleaning or 72 hour quarantine of apparatus, some are feeling concerned about the requirement to keep on assessing CPAC. Teachers are reporting that the number of students that are self-isolating is becoming an increasing concern, a potential barrier to regular CPAC assessment for all A-level science students. Many however recognize and value the assessment already completed last academic year and, coupled with a strong understanding of the requirements for summer 2021 entry, are working to secure enough evidence to report the practical endorsement outcome with recognition that their more regular assessment planning can't operate as well at the moment.

Lesson lengths have changed for many and the way that bubbles are operating across England vary. Often Year Group bubbles operate, however bubbles can be dictated by eg course type also. What is clear from CLEAPSS safety guidance is that understanding bubble arrangement is key. CLEAPSS have produced GL343– Guide to doing practical work during the COVID-19 pandemic, which is updated regularly to reflect the latest guidance from the UK Government and Public Health England. Many teachers and technicians engaging with the resource are more confident going forward with the delivery of practical work to individuals or groups of students, they know when they can repeat required practical work safely with classes and know how (as a teacher) they can position themselves amongst students who are handling equipment given the need to assess them. Of the teachers who took part, at least half had delivered and assessed A-level science practical work during September or early October. A teacher who was operating a bubble that enabled a full class of her A-level Chemistry students to be taught face-to-face for a full teaching day once per fortnight (whilst learning online for the subject alongside) stated that they were coping really well with practical work and enjoying their studies. This model however was rare.

Summary of CPAC assessment strategies to date prior to lockdown

During the first two monitoring cycles, the following strategies were reported by teachers to accelerate the progress that students made against the competencies and skills areas over time. Many of these were identified early on and have become routine practice.

- Share the pass criteria for each CPAC with students prior to their assessment in practical lessons. Many teachers share the mandatory lead teacher online training videos and clips with students to exemplify what they need to do to work at the required standard.
- Make a plan to determine the specific CPAC that will be assessed in each of the required practical activities and additional teacher-led practicals: this is key to ensuring that students can access assessment enough times to deem them as 'consistently and routinely' meeting the pass standard. This is a task specific to each centre where individual teachers know their students.
- Students should be able to discuss practical work as they carry it out to improve their understanding of the link between practical skill development and associated theory.
- Students take photographs of their practical work, not only to support assessment but to remind them of what they did when they are revising from their lab book/practical folder for their examinations.
- Students track their own progress against the CPAC and engagement with ATs throughout the duration of the course, to allow them to set targets to improve weaker areas of their practical work.
- Peer assessment is thought to reinforce students' understanding of the pass criteria.
- Most effective teacher feedback is non-onerous written feedback, strategically managing to raise awareness of what needs to improve.
- Written homework tasks are being used to assess areas of CPAC, particularly CPAC 2c, 3a, 5a and 5b.
- Consistent approaches are being adopted across all three sciences; the CPAC are generic competencies.
- Scheme of learning Year 7-11 strengthened to enable candidates' faster access to making progress against the competencies.

Potential solutions to CPAC assessment barriers this academic year

Many of the above strategies can still be adopted during academic year 2020-21 as can much of the specific feedback reported on Individual Common Practical Assessment Criteria (CPAC 1-5) from Cycle 1 (2015-17) and Cycle 2 (2017-19). Assessment of the specific competency statements that happen as students are carrying out “hands on” practical work in the laboratory however (1a, 2a, 3b and 4a) were a focus for further discussion during the online focus group meetings. Teachers acknowledged the urgent need to plan A-level science practical work in order to secure enough evidence for students to have “consistently and routinely” met the Pass standard in all areas of CPAC 1-5 before the 15th May 2021, the date that teachers report student outcomes through electronic submission. CPAC 1a, 2a, 3b and 4a tend to be competency strands assessed from an early stage of the course in many centres but teachers are keen to secure further assessment of them going forward also.

Explanation of the safety guidance for students carrying out practical work in small groups gave teachers reassurance that they could still check, for CPAC 1a Follows written procedures, that students could carry out method steps in the order written to achieve a set of data expected. Written questions set for homework may provide a solution for many to ensure that students understand the reasons for the method steps. The suggestion that one student in a partnership of, say, two students could carry out alternate steps (1,3 and 5 for example) for the first data set collection, before swapping to carry out steps 2,4 and 6 for the repeat data set, was well received. CPAC 2a, Correctly uses appropriate instrumentation, apparatus and materials (including ICT) to carry out investigative activities, experimental techniques and procedures within minimal assistance or prompting was also thought to be achievable if strong planning allowed equipment to be available and teachers could observe students working whilst adhering to GL343 safety guidance. This same thinking also applies to the assessment of CPAC 4a, Makes accurate observations to the experimental or investigative procedure as teachers need to be in a position to check a reading taken by a student eg when using a burette to check its accuracy.

Several teachers recommended the use of mobile phones: students were taking photographs before emailing the image to their teacher and making a record of that data on collection. A reminder that CPAC assessment is flexible and not expected to be exactly the same for all students in the same practical lesson but more of a differentiated approach; to assess students on a particular CPAC area based on their need to improve their evidence base, most were happier to receive a handful of emails (rather than a full class set) and assess students in this way if necessary. Similarly, many teachers assess CPAC 3a, Identifies hazards and risks, making safety adjustments as necessary, when carrying out experimental techniques or procedures in the lab or field through a homework activity prior to the practical work being carried out in the lab space. The observation of selected students to then be assessed on CPAC 3b, Uses appropriate safety equipment and approaches to minimize risks with minimal prompting could then occur if strong planning ensured that apparatus was available for use.

Teachers have been assessing all other CPAC statements against the Pass criteria either before or after main practical work activity has taken place for a number of years and so there is little concern about them. It was acknowledged that the move from a hard copy lab book to an electronic form eg One Note had happened in many centres and, as long as steps are taken to mitigate the risks of plagiarism to ensure that each students work is their own, there is no problem at all with this. The requirement is simply that each student must produce a contemporaneous record of their work.

Summary

During September and October many teachers have been in touch with AQA to seek clarity around the requirements for summer series 2021 A-level science entries and the practical endorsement. Many have openly discussed their plans with us to seek reassurance and an overwhelming majority are fully committed to ensuring that students on an A-level science pathway can access “hands-on” practical work whenever possible. At the heart of any decision making is student progression and with a sound understanding of what practical skills are required at degree level or equivalent, the teamwork operating within and between centres, with AQA, CLEAPSS and many other stakeholder groups is impressive.