

Course report 2026

Advanced Higher Chemistry, SCQF level 7

We've written this report for teachers and lecturers. We recommend you read this with the published course assessment documents and marking instructions.

Note: we've made changes to the course assessment from session 2026–27.

Check your [subject page](#) for more information.

The report:

- provides a summary of how each course component performed
- highlights areas of the question paper and coursework where candidates performed well and areas where they did not perform well
- has advice you might find useful when preparing candidates for assessment

We collect and prepare the statistics in course reports before we complete the appeals process.

Statistical and grade boundary information

Course entries

Number of resulted entries in 2025: 2,767

Number of resulted entries in 2026: 3,045

Distribution of course awards (including minimum mark to achieve each grade)

Course award	Number of candidates	Percentage	Cumulative percentage	Minimum mark required
A	845	27.8	27.8	108
B	754	24.8	52.5	90
C	675	22.2	74.7	73
D	496	16.3	91.0	55
No award	275	9.0	100	Not applicable

We've not applied rounding to these statistics.

In this report:

- 'Most' means greater than or equal to 70%.
- 'Many' means 50% to 69%.
- 'Some' means 25% to 49%.
- 'Few' or 'a few' means less than 25%.

You can find [statistical reports](#) on our website.

General commentary on grade boundaries

Our main aim when setting grade boundaries is to be fair to candidates across all subjects and levels, and to maintain comparable standards across the years, even as arrangements evolve and change.

For most National Courses, we aim to set examinations and other external assessments and create marking instructions that allow:

- a competent candidate to score a minimum of 50% of the available marks (the notional grade C boundary)
- a well-prepared, very competent candidate to score at least 70% of the available marks (the notional grade A boundary)

It's very challenging to get the standard on target every year, in every subject, at every level. Therefore, we hold a grade boundary meeting for each course to bring together all the information available (statistical and qualitative) and make final decisions on grade boundaries based on this information. Senior Qualifications Scotland staff normally chair these meetings.

Principal assessors use their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. We can adjust the grade boundaries as a result of the discussion at these meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper or other assessment has been more, or less, difficult than usual.

- We can adjust the grade boundaries downwards if there's evidence that the question paper or other assessment has been more difficult than usual.
- We can adjust the grade boundaries upwards if there's evidence that the question paper or other assessment has been less difficult than usual.
- If levels of difficulty are comparable to previous years, we maintain similar grade boundaries.

Every year, we evaluate the performance of our assessments in a fair way, while ensuring standards are maintained so that our qualifications remain credible. To do

this, we measure evidence of candidates' knowledge and skills against the national standard.

For full details of the approach, please refer to the [Awarding and Grading for National Courses Policy](#).

How the course assessment performed

Question paper

Section 1 (multiple-choice) performed as intended.

Section 2 (extended-response) was more demanding than intended. We adjusted the grade boundaries to account for this.

Project

The project performed as intended.

How candidates performed

Areas where candidates performed well

Question paper

Section 1 (multiple-choice)

Most candidates gave the correct response for the following questions.

Question 1	Identifying a d-block element in the periodic table.
Question 6	Identifying a conjugate acid and a conjugate base from an equation.
Question 7	Selecting an appropriate indicator, given the details of a titration.
Question 10	Comparing acid strength using K_a values.
Question 11	Identifying the element with the lowest standard entropy from a list.
Question 12	Identifying the correct graph corresponding to a first order reaction.
Question 14	Determining which compound has the fewest sigma bonds.
Question 18	Predicting how physical properties of amines change with increasing chain length.
Question 19	Identifying the organic compounds in a reaction sequence from the types of reaction occurring in each step.
Question 20	Determining the name of the product of an addition reaction from reactants with shortened structural formulae.
Question 21	Determining the name of a geometric isomer from its skeletal structural formula.

Section 2 (extended-response)

Although the extended-response section proved more demanding than intended, most candidates gave a correct response to the following questions.

- Question 1(c)(i) Stating the effect of heat on the electrons in an atom.
- Question 5(a)(ii)(A) Stating one characteristic of a primary standard.
- Question 7(a)(i) Stating the type of reaction taking place when an aldehyde or ketone reacts with lithium aluminium hydride.
- Question 7(a)(ii) Suggesting why the pi bond between carbon and oxygen is
(A)(II) broken.
- Question 7(c)(i) Naming the other product formed during the reduction of a cyclic ether. (This is a skills question as details of the unfamiliar reaction are given in the question.)
- Question 8(a)(i)(A) Identifying the technique of heating under reflux from the diagram provided.
- Question 10(c)(ii)(A) Drawing an X on a graph to pinpoint the place where a racemic mixture has formed.
- Question 11(a)(i) Stating the area of an enzyme where a molecule binds.
- Question 11(b)(i) Stating the classification of a drug using a description of its function.
- Question 12(c)(ii) Completing the table showing the bonds responsible for the peaks found in the infrared spectrum of creatine.

Project

Most candidates provided an appropriate account of the following parts of the project.

Abstract	Stating the aim of the project and giving a summary of the findings.
Complexity	Performing their main procedure along with either a second procedure, control experiment or standardisation.
Duplication	Duplicating their procedures at least once, from the beginning.
Significant figures	Providing final values to an appropriate number of significant figures.
Conclusion	Using the result of the project to draw a valid conclusion.
Analysis	Finding a literature source of information to compare with their own experimental results.
Structure	Providing a title, contents page and matching set of page numbers.

Areas where candidates did not perform well

Question paper

Section 1 (multiple-choice)

Only some candidates gave the correct response to the following questions.

Question 5	Calculating the pH of a solution of calcium hydroxide.
Question 16	Identifying a reagent that would not react with a specified organic compound.
Question 17	Identifying the shortened structural formula for an unknown alcohol from its reactivity with various reagents.

Section 2 (extended-response)

- Question 1(c)(ii) Some candidates explained why a series of lines are produced in an emission spectrum. Many candidates noted that a line is produced by an electron moving (dropping) between two energy levels but did not go on to explain that there were more than two energy levels present in the atoms giving rise to different lines.
- Question 2(c) A few candidates gained 2 marks for explaining how atomic absorption spectroscopy could be used to determine the concentration of mercury. While some candidates stated that there is a relationship between the intensity of light and the concentration, they did not specify what that relationship is. Many candidates gave a description of a procedure to produce an absorption spectrum but the focus was on identifying mercury rather than determining a concentration. A few candidates gained 2 marks for giving a correct description of a colorimetry experiment.
- Question 3(a)(i)(A) Some candidates identified the correct reaction but did not adequately explain their choice.
- Question 3(a)(i)(B) Few candidates stated the difference between ΔG and ΔG° . As this definition features in the course specification, this question was one of the less-demanding questions in section 2.
- Question 3(a)(ii)(B) Few candidates gained 2 marks. Many candidates included unnecessary information about ligands approaching the metal ions and splitting the d orbitals in their explanations. Some candidates mentioned electron transitions between HOMO and LUMO or the emission of yellow light; these incorrect additions prevented otherwise correct responses from gaining marks.

Question 3(b)(i)	Some candidates went too far with their calculation and calculated the moles of silver that reacted with chloride ions.
Question 3(b)(ii)	Few candidates gained 2 marks for calculating the percentage by mass of sodium chloride in a sample of cheese. Some candidates did not use their answer to part (i) and used the initial moles of silver ions added to the cheese sample in their calculations. Some candidates used the gram formula mass of silver chloride or chloride only in their percentage calculation. Some candidates gained 1 mark for calculating the moles of silver nitrate reacted or for calculating a percentage mass from an incorrect mass of sodium chloride.
Question 4	Few candidates gained 3 marks for describing the techniques that could be used to confirm the formula of an inorganic salt. Many candidates gave an account of how gravimetric analysis could be used to determine the number of water molecules in the formula. They described analytical techniques and gave explanations that were more suited to organic analysis. Most of these responses were not appropriate for an ionic substance.
Question 5(a)(ii)(B)	Some candidates stated the purpose of standardising an EDTA solution to be used in a titration. Many candidates incorrectly stated that the purpose of standardising the EDTA solution was to get a 'known' concentration.
Question 5(b)	Some candidates converted the concentration of calcium carbonate in water from mol l^{-1} into mg l^{-1} and used the result to determine the hardness of a water sample from a table.
Question 6(a)(i)	Some candidates correctly wrote the formula for an unknown substance X found in a balanced equation. The equation was for the reaction of an alcohol with sodium metal, which is in the course specification.

- Question 6(a)(ii) Some candidates correctly named the nucleophile. Many candidates incorrectly gave 'ethanoate ion' as their answer.
- Question 6(a)(iii) Few candidates drew the structural formulae and curly arrows for an S_N2 mechanism. Many candidates incorrectly attached the sodium atom to the ethoxide nucleophile with a covalent bond. This resulted in incorrect curly arrows and an incorrect transition state.
- Question 6(a)(iv) Some candidates stated the systematic name for an ether, given the shortened structural formula. Some candidates incorrectly gave 'ethoxymethane' as the systematic name for the ether.
- Question 6(b)(iii) Some candidates gained 2 marks for calculating an activation energy using an unfamiliar expression. Some candidates did not divide the value for R by 1000 to convert from $J K^{-1} mol^{-1}$ to $kJ K^{-1} mol^{-1}$.
- Question 7(a)(ii)(A)(I) Some candidates explained why a nucleophile can attack the carbon of a carbonyl group. Some candidates incorrectly described a full positive charge on the carbon atom when only a partial positive charge is present.
- Question 7(b) Some candidates correctly drew the structural formula for an ester that could be reduced to form two named alcohols. This question gave candidates an example to follow.
- Question 7(c)(ii) Some candidates explained why one part of a cyclic molecule is more likely to be attacked by a nucleophile during an S_N2 reaction mechanism. Some candidates incorrectly referred to Markovnikov's rule in their answers.
- Question 8(a)(ii) Few candidates gained 2 marks for outlining the four steps involved in a recrystallisation. Only some candidates gained 1 mark by outlining two or three of the steps.

- Question 8(a)(iv) Few candidates gained 2 marks for explaining the effect impurities have on the melting point of a sample. Most candidates stated at least one of the effects of impurities on the melting point of a sample.
- Question 8(b)(i) Some candidates correctly named the reaction type from the reaction sequence.
- Question 8(b)(ii) Some candidates correctly suggested a reagent that could be used to oxidise an alcohol.
- Question 9 Many candidates gave definitions of acidic and basic buffers. Some candidates explained how these worked but not necessarily with reference to the equilibria involved. Some candidates gave the expressions for buffer solutions and indicators in the data booklet, which are not particularly relevant to equilibria. Many candidates focused on the choice of indicator for a titration and drew titration curves. Many candidates did not explain how the addition of acid or base shifts the equilibria in indicators or buffer solutions. As a result, few candidates gained 3 marks for this question.
- Question 10(a)(i) Some candidates correctly completed the equation for the second dissociation of tartaric acid.
- Question 10(b)(ii)(B)(I) Some candidates wrote the correct expression for the equilibrium constant from the equation.
- Question 10(b)(ii)(B)(II) Some candidates calculated the number of moles of tartaric acid in one of the layers during an extraction, using the value for the equilibrium constant. Some candidates correctly calculated the concentration but did not continue the calculation to work out the number of moles.

- Question 10(b)(ii)(C) Few candidates suggested an improvement to the extraction procedure. Many candidates did not make it clear that the extraction should be repeated using smaller volumes of the solvent but not smaller volumes of the aqueous solution.
- Question 11(a)(ii) Few candidates identified that a molecule has bound to an enzyme active site by a covalent bond. Many candidates either described how an enzyme inhibitor works or stated that the pesticide had bound to the enzyme by hydrogen bonding.
- Question 12(b)(ii) Few candidates identified the ion fragment responsible for a peak on a mass spectrum. Some candidates identified the correct fragment, but they did not include a charge or square brackets.
- Question 12(d) Some candidates stated the effect on peak splitting when there are no hydrogen atoms on neighbouring carbon atoms. Many candidates suggested that there was only one peak present in the spectrum.
- Question 12(e) Few candidates determined and completed a structural formula based on analytical evidence given elsewhere in the question. Many candidates added onto the structure in an inappropriate place, resulting in the bottom nitrogen atom having more than three bonds attached.

Project

Only some candidates produced an acceptable risk assessment for their experimental work. Many candidates missed out on this mark for various reasons, including:

- not recording the flammability of indicators
- exaggerating the hazards associated with dilute solutions
- not distinguishing between solids and solutions when they used both

Preparing candidates for assessment

You should refer to the Advanced Higher Chemistry Course Specification on our [website](#).

Our [Understanding Standards website](#) has examples of candidate evidence from the project and question paper with commentary to help you prepare candidates for assessment and understand how we apply national standards.

Question paper

Questions linked to statements in the course specification

You should encourage candidates to practise accurately describing and explaining terminology from the Advanced Higher Chemistry Course Specification. There are approximately 12 marks in the question paper just for making statements straight from the course specification.

Researching chemistry questions

You should make sure candidates know that the question paper features approximately 22 marks that assess knowledge and skills relating to the 'researching chemistry' section of the course.

You should provide opportunities for candidates to gain practical experience of using apparatus and techniques as this helps them to answer these questions. You should ensure that candidates can describe the correct procedures associated with the apparatus and techniques listed in the course specification.

Project

You should refer to the most up-to-date Advanced Higher Chemistry Project Assessment Task on our [website](#). You must provide candidates with a copy of the latest 'Instructions for candidates' section.

Choosing a topic to research

You should pay particular attention to the instructions in the 'Choosing the topic' section on page 5 of the Advanced Higher Chemistry Project Assessment Task.

You must ensure that each candidate has chosen a different chemistry topic to research, avoiding similar underlying chemistry. For example, determining the percentage mass of calcium carbonate in seashells and determining the percentage mass of calcium carbonate in antacids are the same chemistry topic (determination of percentage mass of calcium carbonate by back titration). The underlying chemistry is similar. It would only be acceptable for candidates in the same centre to complete these two projects if the centre presented more than 10 candidates. A centre can only repeat a topic once in every 10 projects.

Abstract

You should advise candidates to avoid including the word 'purity' in their aims. The aim 'Calculate the percentage purity of calcium carbonate in eggshells' would not gain a mark.

Aims about determining the purity of a synthesised or extracted product require a numerical value for purity in the conclusion. Performing melting point analyses and/or thin-layer chromatography alone would not be sufficient for this aim.

You should encourage candidates to copy and paste their conclusion into their abstract instead of typing a new version. This can help avoid inconsistencies.

Underlying chemistry

You should remind candidates that they should not include irrelevant, historical or biological information in their underlying chemistry. Candidates must focus only on the reactions and techniques used in their project and the chemistry behind these and relate this to the reactions and experimental techniques they have used.

Data collection and handling

You should make sure candidates know they must provide concentrations and/or states when giving the hazards associated with chemicals. Candidates should give the hazards appropriate for these concentrations and/or states. For example, 'harmful by inhalation' is not appropriate to describe solutions that do not give off gas.

You should encourage candidates to use our past papers to familiarise themselves with the format of data tables. Past papers (available on the [past papers and marking instructions](#) page of our website) are a good source of correctly formatted tables with appropriate headings and units.

You should remind candidates to follow the guidance on citation and referencing in the 'Instructions for candidates' section of the Advanced Higher Chemistry Project Assessment Task. Candidates must use this number system and must ensure that citations and references are in numerical order.

Data analysis

Generally, candidates duplicate their procedures; however, some candidates average their duplicate raw results before processing. If candidates average their duplicate raw results before processing, they cannot access the full range of marks for data analysis. Candidates must carry out calculations on duplicate raw results separately to produce two final values.

You should advise candidates that they should not try to achieve concordancy or average results for analyses they perform on separate samples. For example, if a candidate takes separate fresh samples of orange juice from a carton for a titration, they should not expect concordant results or average the titre values obtained (unless they first diluted the sample of orange juice in a standard flask and used samples from the standard flask).

Candidates do not need to include graphs in their projects. If candidates include graphs, they must label them appropriately (with correctly formatted units) and use sufficient gridlines that allow markers to check the accuracy of their plotting.

Candidates should amend labels and/or units by hand in electronically produced graphs, if necessary.

You should advise candidates that, in the analysis section, they must only compare duplicate results or results with a control experiment if there is no other literature source available. Candidates must make an attempt to find a literature source to compare. If none is available, then the candidate must state this. Candidates may need to convert their results to compare them. For example, if a manufacturer gives the concentration of a substance as a percentage, but the candidate calculates the concentration in mol l^{-1} , the candidate would need to convert one unit into the other before making a comparison.

Evaluation

You should make it clear to candidates that when they make evaluative statements about the procedures used, they must state the precise effect this will have on the final results. For example, a candidate who identifies transfer losses during a synthesis should go on to say that this would result in a lower percentage yield value. Stating that the final result would be inaccurate is not sufficient.

Candidates should only calculate uncertainties for measurements where they use the measurement in a calculation leading to the final result. For example, candidates should not include uncertainties associated with measuring cylinders used to add substances in excess. When calculating uncertainties associated with burettes, candidates should use the titre volume in the calculation, and not the total volume of the burette. Candidates should only carry out uncertainty calculations for analysis experiments. Calculating an absolute uncertainty of a percentage yield is irrelevant because a percentage yield is already a comparison with an expected value.

Structure

You should encourage candidates to check their project report after they print it to make sure the headings for sections and tables do not split over multiple pages. They should also make sure the contents page only includes the main sections of the report.

Changes to the course assessment from session 2026–27

- Reduced the question paper from 110 marks to 100 marks, and removed scaling. Section 2 now has 75 marks instead of 85.
- Reduced the duration of the question paper from 3 hours to 2 hours and 30 minutes.
- The project still has 25 marks, and is now scaled to 34 marks instead of 40.

We've amended the question paper details in the course specification. There's no change to teaching and learning. You might want to update your assessments, for example prelims, to reflect the changes to the question paper.