National 5 Chemistry:

Guidance on assessments and gathering evidence

Contents

Introduction

The purpose of this document is to provide guidance on constructing assessments for National 5 Chemistry for gathering evidence for candidate estimates. This document should be read alongside *National Courses: guidance on gathering evidence and producing estimates* and *National 5 Chemistry: Guidance on gathering key evidence for producing estimates in session 2020–21*.

The **key pieces** of evidence in chemistry are:

- an examination, covering as much of the course as possible
- an end-of-course test or top-up examination that includes the areas of the course not covered in the first examination
- end-of-topic tests that include grade A marks, which may be used as supplementary evidence to support the above examinations

You must gather these pieces of evidence in closed-book conditions and under a high degree of supervision and control. The closer the evidence is to the standard, format, and duration of the National 5 Chemistry question paper the more realistic and reliable your estimates should be. You should form holistic judgements when considering candidate evidence and give greater weight to the evidence that mirrors the SQA question paper most closely.

Centres should have a robust evidence base for the grades they submit to SQA. In many subjects, candidates' work on unseen tasks, in supervised conditions, will provide such evidence. How such evidence is generated is for the centre to decide, for example they may decide to split an examination over a number of lessons. Ideally the centre will provide several opportunities for candidates to demonstrate what they know, understand, and can do, at appropriate points in the course delivery.

Assessment structure

Assessments should contain approximately 30% grade A marks which require candidates to demonstrate a consistently high performance in relation to the skills, knowledge and understanding for the course. Grade A marks relate to the level of demand of a question rather than the difficulty candidates may have with a question. This usually involves questions testing more complex higher order skills such as analysis and evaluating.

The remaining marks are targeted at grade C candidates, as grade B candidates will achieve most grade C marks and some grade A marks. Questions with grade C marks require candidates to demonstrate successful performance in relation to the skills, knowledge and understanding for the course.

If using past SQA paper questions to produce assessments, care should be taken not to take too many questions from the same past paper. Instead, questions should be drawn from a number of past paper sources. When constructing assessments, it is advised to

construct section 2 (written) of the paper first, then to fill any gaps in coverage using section 1 (objective) questions.

National 5 Chemistry question paper brief

	Marks		
Component	**Knowledge and understanding (KU)**	**Skills**	**Total**
Question paper	67+/-7	33+/-7	100

Knowledge and understanding/skills	**Number of marks**
♦ demonstrating knowledge and understanding of chemistry by making statements	~ 15
♦ demonstrating knowledge and understanding of chemistry by providing descriptions and explanations	~ 10
♦ applying knowledge and understanding of chemistry to new situations, interpreting information and solving problems	~ 40
♦ planning or designing experiments to test given hypotheses or to illustrate particular effects, including safety measures	~ 35
♦ selecting information	
♦ presenting information appropriately in a variety of forms	
♦ processing information (using calculations and units, where appropriate)	
♦ making predictions and generalisations based on evidence/information	
♦ drawing valid conclusions and giving explanations supported by evidence/justification	
♦ suggesting improvements to experimental procedures	

Additional information

Two open-ended questions of three marks each.
‘A’ type marks: approximately 30%.

Breakdown of National 5 Chemistry past papers 2019–2016

The following tables provide the structure of the questions in the SQA National 5 Chemistry past papers 2019–2016 in section 1 and section 2 by key area, knowledge/skill, and grade A marks.

2019 – Section 1

Question	Area of course	Question type	Grade A
1	Rates of reaction	Applying knowledge to new situations, interpreting, solving problems	
2	Rates of reaction	Applying knowledge to new situations, interpreting, solving problems	
3	Periodic table and atoms	Applying knowledge to new situations, interpreting, solving problems	
4	Ionic compounds	Applying knowledge to new situations, interpreting, solving problems	
5	Non-specific	Applying knowledge to new situations, interpreting, solving problems	
6	Covalent bonding	Applying knowledge to new situations, interpreting, solving problems	
7	Ionic compounds	Applying knowledge to new situations, interpreting, solving problems	1
8	Ionic compounds	Applying knowledge to new situations, interpreting, solving problems	
9	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	
10	Percentage composition	Drawing conclusions and giving explanations	
11	pH	Drawing conclusions and giving explanations	
12	pH	Applying knowledge to new situations, interpreting, solving problems	
13	Systematic carbon chemistry	Applying knowledge to new situations, interpreting, solving problems	
14	Alkenes	Applying knowledge to new situations, interpreting, solving problems	1
15	Alkenes	Drawing conclusions and giving explanations	1
16	Non-specific	Applying knowledge to new situations, interpreting, solving problems	
17	Carboxylic acids	Applying knowledge to new situations, interpreting, solving problems	
18	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
19	Reactions of metals	Applying knowledge to new situations, interpreting, solving problems	
20	Representation of the structure of monomers and polymers	Drawing conclusions and giving explanations	1
21	General practical techniques	Applying knowledge to new situations, interpreting, solving problems	1
22	Analytical methods	Applying knowledge to new situations, interpreting, solving problems	
23	Analytical methods	Knowledge and understanding - making statements	
24	Analytical methods	Knowledge and understanding - making statements	
25	Neutralisation reactions	Processing information (using calculations and units)	

2019 – Section 2

Question	Area of course	Question type	Grade A
1(a)	Covalent bonding	Applying knowledge to new situations, interpreting, solving problems	
1(b)(i)	Periodic table and atoms	Applying knowledge to new situations, interpreting, solving problems	
1(b)(ii)	Periodic table and atoms	Knowledge and understanding - descriptions and explanations	
1(b)(iii)	Periodic table and atoms	Drawing conclusions and giving explanations	
1(c)	Non-specific	Processing information (using calculations and units)	
2(a)	Alcohols	Applying knowledge to new situations, interpreting, solving problems	
2(b)	Non-specific	Selecting information	
2(c)	Reactions of metals	Applying knowledge to new situations, interpreting, solving problems	
2(d)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	
3(a)	Covalent bonding	Applying knowledge to new situations, interpreting, solving problems	1
3(b)	Commercial production of fertilisers	Drawing conclusions and giving explanations	
3(c)(i)	Haber and Ostwald processes	Making predictions and generalisations	
3(c)(ii)	Haber and Ostwald processes	Presenting information appropriately in a variety of forms	1
3(d)(i)	Haber and Ostwald processes	Processing information (using calculations and units)	
3(d)(ii)	Non-specific	Suggesting improvements to experimental procedures	
4(a)	Radiation	Knowledge and understanding - making statements	
4(b)(i)	Half-life	Knowledge and understanding - making statements	
4(b)(ii)	Half-life	Processing information (using calculations and units)	1
4(b)(iii)	Half-life	Knowledge and understanding - making statements	1
5(a)	Systematic carbon chemistry	Knowledge and understanding - making statements	
5(b)(i)	Alkenes	Applying knowledge to new situations, interpreting, solving problems	1
5(b)(ii)	Alkenes	Drawing conclusions and giving explanations	
5(b)(iii)	Addition polymerisation	Applying knowledge to new situations, interpreting, solving problems	1
5(c)(i)	Calculations involving the mole and balanced equations	Processing information (using calculations and units)	1
5(c)(ii)	Systematic carbon chemistry	Applying knowledge to new situations, interpreting, solving problems	1
6	pH, neutralisation reactions	Knowledge and understanding - descriptions and explanations	2
7(a)	Systematic carbon chemistry	Knowledge and understanding - making statements	
7(b)(i)	Alkanes	Applying knowledge to new situations, interpreting, solving problems	
7(b)(ii)	Alkanes	Processing information (using calculations and units)	

Question	Area of course	Question type	Grade A
7(c)	Systematic carbon chemistry	Making predictions and generalisations	
8(a)	Metallic bonding	Selecting information	
8(b)	Chemical formulae	Applying knowledge to new situations, interpreting, solving problems	
8(c)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	1
8(d)	Extraction of metals	Knowledge and understanding - making statements	
8(e)	Nuclear equations	Applying knowledge to new situations, interpreting, solving problems	1
9(a)	Energy from fuels	Knowledge and understanding - making statements	
9(b)(i)	Energy from fuels	Applying knowledge to new situations, interpreting, solving problems	1
9(b)(ii)	Reporting experimental work	Suggesting improvements to experimental procedures	1
9(c)(i)	Alcohols	Drawing conclusions and giving explanations	
9(c)(ii)	Alcohols	Applying knowledge to new situations, interpreting, solving problems	
10(a)	Electrochemical cells	Planning or designing experiments	
10(b)(i)	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
10(b)(ii)	Redox	Applying knowledge to new situations, interpreting, solving problems	
10(b)(iii)	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
10(c)	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
11(a)	Chemical formulae	Applying knowledge to new situations, interpreting, solving problems	
11(b)	Carboxylic acids	Applying knowledge to new situations, interpreting, solving problems	1
11(c)	Neutralisation reactions used to prepare soluble salts	Planning or designing experiments	1
11(d)	Neutralisation reactions used to prepare soluble salts	Planning or designing experiments	
12(a)(i)	Analytical methods	Knowledge and understanding - making statements	1
12(a)(ii)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	1
12(b)(i)	Reporting experimental work	Suggesting improvements to experimental procedures	
12(b)(ii)	Analytical methods	Knowledge and understanding - making statements	
12(b)(iii)	Analytical methods	Knowledge and understanding - making statements	
12(b)(iv)	Neutralisation reactions	Processing information (using calculations and units)	1
13	Ionic compounds, chemical formulae	Knowledge and understanding - descriptions and explanations	2

2018 – Section 1

Question	Area of course	Question type	Grade A
1	Rates of reaction	Knowledge and understanding - making statements	
2	Periodic table and atoms	Knowledge and understanding - making statements	
3	Covalent bonding	Knowledge and understanding - making statements	
4	Covalent bonding	Applying knowledge to new situations, interpreting, solving problems	
5	Ionic compounds	Applying knowledge to new situations, interpreting, solving problems	
6	Covalent bonding	Applying knowledge to new situations, interpreting, solving problems	
7	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	
8	pH	Knowledge and understanding - making statements	
9	pH	Knowledge and understanding - making statements	1
10	Systematic carbon chemistry	Applying knowledge to new situations, interpreting, solving problems	
11	Systematic carbon chemistry	Applying knowledge to new situations, interpreting, solving problems	
12	Alkenes	Knowledge and understanding - making statements	1
13	Alcohols	Applying knowledge to new situations, interpreting, solving problems	1
14	Alcohols	Applying knowledge to new situations, interpreting, solving problems	1
15	General practical techniques	Suggesting improvements to experimental procedures	
16	Non-specific	Drawing conclusions and giving explanations	1
17	Reactions of metals	Drawing conclusions and giving explanations	
18	Redox	Applying knowledge to new situations, interpreting, solving problems	
19	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
20	Commercial production of fertilisers	Applying knowledge to new situations, interpreting, solving problems	
21	Haber and Ostwald processes	Knowledge and understanding - making statements	
22	Radiation	Applying knowledge to new situations, interpreting, solving problems	
23	Metallic bonding	Knowledge and understanding - making statements	
24	Analytical methods	Applying knowledge to new situations, interpreting, solving problems	
25	Neutralisation reactions used to prepare soluble salts	Planning or designing experiments	

2018 – Section 2

Question	Area of course	Question type	Grade A
1(a)	Neutralisation reactions	Knowledge and understanding - making statements	
1(b)(i)	Rates of reaction	Applying knowledge to new situations, interpreting, solving problems	1
1(b)(ii)	Neutralisation reactions	Presenting information appropriately in a variety of forms	1
1(b)(iii)	Non-specific	Processing information (using calculations and units)	
1(c)	Neutralisation reactions	Knowledge and understanding - descriptions and explanations	1
2(a)(i)	Addition polymerisation	Applying knowledge to new situations, interpreting, solving problems	
2(a)(ii)	Representation of the structure of monomers and polymers	Applying knowledge to new situations, interpreting, solving problems	
2(b)	Representation of the structure of monomers and polymers	Drawing conclusions and giving explanations	
3(a)	Energy from fuels	Making predictions and generalisations	
3(b)	Percentage composition	Applying knowledge to new situations, interpreting, solving problems	
4(a)	Systematic carbon chemistry	Knowledge and understanding - making statements	
4(b)	Alkanes	Applying knowledge to new situations, interpreting, solving problems	
4(c)	Systematic carbon chemistry	Applying knowledge to new situations, interpreting, solving problems	
4(d)	Systematic carbon chemistry	Making predictions and generalisations	
5(a)	Non-specific	Selecting information	
5(b)	Analytical methods	Drawing conclusions and giving explanations	
5(c)	Chemical formulae	Applying knowledge to new situations, interpreting, solving problems	
5(d)	Rates of reaction	Drawing conclusions and giving explanations	
6(a)(i)	Periodic table and atoms	Processing information (using calculations and units)	
6(a)(ii)	Periodic table and atoms	Processing information (using calculations and units)	
6(b)	Periodic table and atoms	Applying knowledge to new situations, interpreting, solving problems	
7(a)	Ionic compounds	Knowledge and understanding - making statements	
7(b)(i)	Ionic compounds	Knowledge and understanding - making statements	
7(b)(ii)	Redox	Knowledge and understanding - making statements	
7(b)(iii)	Extraction of metals	Knowledge and understanding - descriptions and explanations	1
8	Covalent bonding	Knowledge and understanding - descriptions and explanations	2
9(a)(i)	Systematic carbon chemistry	Knowledge and understanding - making statements	
9(a)(ii)	Systematic carbon chemistry	Knowledge and understanding - making statements	
9(b)	Energy from fuels	Applying knowledge to new situations, interpreting, solving problems	1
10(a)(i)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	

Question	Area of course	Question type	Grade A
10(a)(ii)	pH	Knowledge and understanding - making statements	
10(b)	Covalent bonding	Applying knowledge to new situations, interpreting, solving problems	
10(c)	Haber and Ostwald processes	Knowledge and understanding - making statements	
10(d)	Commercial production of fertilisers	Applying knowledge to new situations, interpreting, solving problems	
11(a)	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
11(b)	Electrochemical cells	Knowledge and understanding - making statements	
11(c)	Electrochemical cells	Applying knowledge to new situations, interpreting, solving problems	
11(d)	General practical techniques	Planning or designing experiments	
12(a)	Radiation	Applying knowledge to new situations, interpreting, solving problems	
12(b)	Half-life	Applying knowledge to new situations, interpreting, solving problems	1
12(c)	Nuclear equations	Applying knowledge to new situations, interpreting, solving problems	1
13(a)(i)	Carboxylic acids	Knowledge and understanding - making statements	
13(a)(ii)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	
13(b)	Carboxylic acids	Drawing conclusions and giving explanations	1
13(c)	Carboxylic acids	Drawing conclusions and giving explanations	
14(a)	Non-specific	Processing information (using calculations and units)	
14(b)(i)	Common chemical apparatus	Planning or designing experiments	
14(b)(ii)	Analytical methods	Knowledge and understanding - descriptions and explanations	
14(b)(iii)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	1
15(a)	Non-specific	Selecting information	
15(b)(i)	Non-specific	Processing information (using calculations and units)	1
15(b)(ii)	General practical techniques	Applying knowledge to new situations, interpreting, solving problems	
15(c)	Chemical formulae	Applying knowledge to new situations, interpreting, solving problems	1
16(a)(i)	Systematic carbon chemistry	Knowledge and understanding - making statements	
16(a)(ii)	Systematic carbon chemistry	Applying knowledge to new situations, interpreting, solving problems	
16(b)	Energy from fuels	Drawing conclusions and giving explanations	1
16(c)	Calculations involving the mole and balanced equations	Applying knowledge to new situations, interpreting, solving problems	1
17	Alkenes, carboxylic acids, addition polymerisation	Knowledge and understanding - descriptions and explanations	2

2017 – Section 1

Question	Area of course	Question type	Grade A
1	Rates of reaction	Using KU to solve problems	
2	Atomic structure, bonding and properties	Using KU to solve problems	
3	Formulae and reactant quantities	Using KU to solve problems	1
4	Atomic structure, bonding and properties	Concluding and evaluating	1
5	Acids and bases	Using KU to solve problems	
6	Acids and bases	Using KU to solve problems	
7	Formulae and reactant quantities	Process information (including calculations)	
8	Formulae and reactant quantities	Using KU to solve problems	
9	Formulae and reactant quantities	Using KU to solve problems	1
10	Homologous series	Using KU to solve problems	
11	Homologous series	Using KU to solve problems	
12	Homologous series	Concluding and evaluating	1
13	Everyday consumer products	Making accurate statements	
14	Energy from fuels	Making accurate statements	
15	Metals	Using KU to solve problems	
16	Metals	Using KU to solve problems	
17	Fertilisers	Making accurate statements	
18	Fertilisers	Making accurate statements	
19	Chemical analysis	Using KU to solve problems	
20	Chemical analysis	Making accurate statements	

2017 – Section 2

Question	Area of course	Question type	Grade A
1(a)	Atomic Structure, bonding and properties	Making accurate statements	
1(b)	Atomic Structure, bonding and properties	Describing and explaining	
1(c)	Atomic Structure, bonding and properties	Concluding and evaluating	
2(a)	Non-specific	Selecting and presenting information	
2(b)	Non-specific	Selecting and presenting information	
2(c)	Formulae and reactant quantities	Using KU to solve problems, process information (including calculations)	1
3(a)	Atomic Structure, bonding and properties	Using KU to solve problems	
3(b)	Atomic Structure, bonding and properties	Making accurate statements	
3(c)	Atomic Structure, bonding and properties	Using KU to solve problems	
3(d)	Atomic Structure, bonding and properties	Using KU to solve problems	
4(a)(i)	Metals	Selecting and presenting information	
4(a)(ii)	Metals	Concluding and evaluating	
4(b)	Metals	Using KU to solve problems	1
5(a)(i)	Nuclear chemistry	Using KU to solve problems	
5(a)(ii)	Nuclear chemistry	Using KU to solve problems, process information (including calculations)	
5(b)	Nuclear chemistry	Using KU to solve problems	
6	Rates of reactions, metals	Describing and explaining	2
7(a)	Everyday consumer products	Making accurate statements	
7(b)(i)	Everyday consumer products	Using KU to solve problems	
7(b)(ii)	Everyday consumer products	Concluding and evaluating	1
8(a)(i)	Metals	Concluding and evaluating	
8(a)(ii)	Atomic Structure, bonding and properties	Making accurate statements	
8(b)	Metals	Using KU to solve problems	
9(a)	Homologous series	Making accurate statements	
9(b)	Homologous series	Using KU to solve problems	
9(c)(i)	Homologous series	Predictions and generalisations	
9(c)(ii)	Homologous series	Predictions and generalisations	
10(a)(i)	Metals	Planning and designing	
10(a)(ii)	Metals	Using KU to solve problems	1
10(b)	Metals	Using KU to solve problems, process information (including calculations)	
11(a)	Acids and bases	Concluding and evaluating	1

Question	Area of course	Question type	Grade A
11(b)	Acids and bases	Predictions and generalisations	
12(a)	Everyday consumer products	Using KU to solve problems	
12(b)	Everyday consumer products	Making accurate statements	
12(c)	Energy from fuels	Using KU to solve problems, process information (including calculations)	2
13(a)	Homologous series	Using KU to solve problems	
13(b)(i)	Properties of plastics	Using KU to solve problems	
13(b)(ii)	Properties of plastics	Using KU to solve problems	
13(c)(i)	Homologous series	Concluding and evaluating	1
13(c)(ii)	Homologous series	Concluding and evaluating	
14(a)(i)	Everyday consumer products	Using KU to solve problems	
14(a)(ii)	Everyday consumer products	Predictions and generalisations	
14(b)	Energy from fuels	Using KU to solve problems, process information (including calculations)	1
15	Acids and bases, chemical analysis	Describing and explaining	2

2016 – Section 1

Question	Area of course	Question type	Grade A
1	Atomic structure, bonding and properties	Using KU to solve problems	
2	Rates of reaction	Concluding and evaluating	
3	Atomic structure, bonding and properties	Using KU to solve problems	1
4	Metals	Using KU to solve problems	
5	Atomic structure, bonding and properties	Making accurate statements	
6	Atomic structure, bonding and properties	Using KU to solve problems	
7	Atomic structure, bonding and properties	Using KU to solve problems	1
8	Acids and bases	Using KU to solve problems	
9	Homologous series	Using KU to solve problems	
10	Homologous series	Using KU to solve problems	
11	Homologous series	Using KU to solve problems	
12	Homologous series	Using KU to solve problems	
13	Everyday consumer products	Making accurate statements	
14	Homologous series	Concluding and evaluating	1
15	Metals	Using KU to solve problems	
16	Properties of plastics	Using KU to solve problems	1
17	Nuclear chemistry	Concluding and evaluating	
18	Nuclear chemistry	Using KU to solve problems	
19	Nuclear chemistry	Using KU to solve problems	
20	Chemical analysis	Using KU to solve problems	

2016 – Section 2

Question	Area of course	Question type	Grade A
1(a)(i)	Atomic structure, bonding and properties	Making accurate statements	
1(a)(ii)	Atomic structure, bonding and properties	Making accurate statements	
1(b)	Atomic structure, bonding and properties	Process information (including calculations)	
1(c)(i)	Atomic structure, bonding and properties	Making accurate statements	
1(c)(ii)	Fertilisers	Making accurate statements	
2(a)	Properties of plastics	Using KU to solve problems	
2(b)	Properties of plastics	Using KU to solve problems	
3(a)	Energy from fuels	Making accurate statements	
3(b)(i)	Rates of reaction	Using KU to solve problems, process information (including calculations)	1
3(b)(ii)	Non-specific	Concluding and evaluating	
3(b)(iii)	Rates of reaction	Making accurate statements	
3(c)(i)	Acids and bases	Using KU to solve problems	
3(c)(ii)	Energy from fuels	Using KU to solve problems, process information (including calculations)	1
4(a)(i)	Non-specific	Concluding and evaluating	
4(a)(ii)	Non-specific	Concluding and evaluating	
4(b)	Metals	Using KU to solve problems, process information (including calculations)	1
5(a)	Non-specific	Concluding and evaluating	
5(b)	Atomic structure, bonding and properties	Using KU to solve problems	
5(c)(i)	Formulae and reactant quantities	Using KU to solve problems	
5(c)(ii)	Non-specific	Selecting and presenting information	
5(d)	Acids and bases	Using KU to solve problems	
6(a)(i)	Chemical analysis	Using KU to solve problems	
6(a)(ii)	Fertilisers	Concluding and evaluating	1
6(b)	Formulae and reactant quantities	Using KU to solve problems	
7	Atomic structure, bonding and properties	Describing and explaining	2
8(a)	Homologous series	Using KU to solve problems	1
8(b)	Non-specific	Planning and designing	
8(c)(i)	Homologous series	Making accurate statements	
8(c)(ii)	Homologous series	Using KU to solve problems	1

Question	Area of Course	Question Type	Grade A
9(a)	Energy from fuels	Planning and designing, concluding and evaluating	1
9(b)(i)	Everyday consumer products	Predictions and generalisations	
9(b)(ii)	Everyday consumer products	Predictions and generalisations	
9(c)	Energy from fuels	Using KU to solve problems, process information (including calculations)	1
10(a)	Metals	Making accurate statements	
10(b)(i)	Metals	Using KU to solve problems	
10(b)(ii)	Metals	Planning and designing	
10(c)(i)	Metals	Using KU to solve problems	
10(c)(ii)	Metals	Using KU to solve problems	1
10(c)(iii)	Atomic structure, bonding and properties	Making accurate statements	
11(a)	Homologous series	Concluding and evaluating	
11(b)	Homologous series	Using KU to solve problems	
11(c)	Homologous series	Making accurate statements	
11(d)(i)	Homologous series	Concluding and evaluating	
11(d)(ii)	Homologous series	Concluding and evaluating	1
12(a)	Everyday consumer products	Making accurate statements	
12(b)	Acids and bases	Concluding and evaluating	1
12(c)	Acids and bases	Using KU to solve problems	
12(d)	Formulae and reactant quantities	Using KU to solve problems	
13	Acids and bases, chemical analysis	Describing and explaining	2

Marking reliability

Teachers and lecturers should be familiar with the general marking principles for National 5 Chemistry (see Appendix) and the published marking instructions that accompany SQA past papers, as these demonstrate the required marking standard.

Centre-devised marking instructions should follow the same format and standard as those published by SQA. It is good practice to prepare the marking instructions at the same time as the assessment is constructed. Marking instructions can then be refined in light of candidate responses and should be agreed between all markers and applied consistently. Cross-marking of a sample of each markers work should occur to ensure the marking instructions have been applied accurately and consistently.

Some common marking issues include:

- inconsistent application of the marking instructions
- arithmetical errors when totalling marks
- substitution of data
- calculations with a carry forward error
- identifying where a mark has been allocated in open-ended questions.

Marks should only be allocated based on the written response and not what the response infers.

Cut-off scores

The notional cut-off scores for course assessment are:

70% A grade
60% B grade
50% C grade
40% D grade

Cut-off scores should be appropriate to the instrument of assessment. They should be amended to reflect any differences between centre assessments and SQA question papers.

Such differences could include:

- an assessment being split over a number of sessions
- assessments with an insufficient number of A-type marks
- assessments that do not adequately sample the skills, knowledge and understanding of the course
- assessments that do not adequately integrate the skills, knowledge and understanding of the course

You should raise the cut-off scores above notional difficulty to reflect such differences.

It is important to note that sometimes intended grade A marks perform as relatively straightforward marks. The overall performance of the cohort should therefore be reviewed after all candidates' assessments have been marked. If the grade A marks did not perform as intended, you should consider why this might be and whether the grade cut-off score should be adjusted to reflect candidate performance.

A question that is considered as relatively straightforward may yield responses that are significantly different to the marking instructions, suggesting that the wording of the question caused confusion, or that the question was too challenging. Grade cut-off scores may need to be adjusted to reflect this.

Appendix – General marking principles for National 5 Chemistry

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this paper. These principles must be read in conjunction with the detailed marking instructions, which identify the key features required in candidate responses.

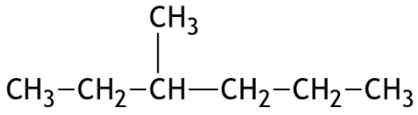
(a) Marks for each candidate response must <u>always</u> be assigned in line with these general marking principles and the detailed marking instructions for this assessment.

(b) If a specific candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you should discuss this with the other markers and agree how to apply the marking instructions.

(c) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

A guiding principle in marking is to give credit for correct chemistry rather than to look for reasons not to award marks.

Example 1: The structure of a hydrocarbon found in petrol is shown below.



Name the hydrocarbon.

Although the punctuation is not correct, '3, methyl-hexane' should gain the mark.

Example 2: A student measured the pH of four carboxylic acids to find out how their strength is related to the number of chlorine atoms in the molecule.

The results are shown in the table.

Structural formula	*pH*
CH_3COOH	1·65
$CH_2ClCOOH$	1·27
$CHCl_2COOH$	0·90
CCl_3COOH	0·51

State how the strength of the acids is related to the number of chlorine atoms in the molecule.

Although not completely correct, an answer such as 'the more Cl_2, the stronger the acid' should gain the mark.

(d) There are no half marks awarded.

(e) Candidates must respond to the 'command' word as appropriate and may be required to write extended answers in order to communicate fully their knowledge and understanding.

(f) Marks should be awarded for answers that have incorrect spelling or loose language **as long as the meaning of the word(s) is conveyed. Example**: Answers like 'distilling' (for 'distillation') and 'it gets hotter' (for 'the temperature rises') should be accepted.

However, the example below would not be given any credit, as an incorrect chemical term, which the candidate should know, has been given.

Example: If the correct answer is 'ethene', and the candidate's answer is 'ethane', this should not be accepted.

(g) A correct answer followed by a wrong answer should be treated as a cancelling error and no marks should be awarded.

Example: State what colour is seen when blue Fehling's solution is warmed with an aldehyde.

The answer 'red, green' gains no marks.

If a correct answer is followed by additional information which does not conflict, the additional information should be ignored, whether correct or not.

Example: State why the tube cannot be made of copper.

If the correct answer is related to a low melting point, 'Copper has a low melting point and is coloured grey' would not be treated as having a cancelling error.

(h) Unless a numerical question specifically requires evidence of working to be shown, full marks should be awarded for a correct final answer (including units if required) on its own.

The partial marks shown in the marking scheme are for use when working is given but the final answer is incorrect. An exception is when candidates are asked to 'Find, by calculation', when full marks cannot be awarded for the correct answer without working.

(i) In most questions units are not required. However, if the candidate writes units then they must be correct. An incorrect unit would not be acceptable and one mark would not be awarded.

This marking instruction must only be applied a maximum of once per paper.

(j) Where the marking instructions specifically allocate a mark for units in a calculation, this mark should not be awarded if the units are incorrect or missing. Missing or incorrect units at intermediate stages in a calculation should be ignored.

(k) As a general rule, where a wrong numerical answer (already penalised) is carried forward to another step, credit will be given provided the result is used correctly. The exception to this rule is where the marking instructions for a numerical question assign separate ‘concept marks’ and an ‘arithmetic mark’. In such situations, the marking instructions will give clear guidance on the assignment of partial marks.

(l) Ignore the omission of one H atom from a full structural formula provided the bond is shown or one carbon to hydrogen bond missing provided the hydrogen is shown.

(m) A symbol or correct formula should be accepted in place of a name **unless stated otherwise in the marking instructions**.

(n) When formulae of ionic compounds are given as answers it will only be necessary to show ion charges if these have been specifically asked for. However, if ion charges are shown, they must be correct. If incorrect charges are shown, no marks should be awarded.

(o) If an answer comes directly from the text of the question, no marks should be awarded.

Example: A student found that 0·05 mol of propane, C_3H_8 burned to give 82·4 kJ of energy.

$$C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(l)$$

Name the type of enthalpy change which the student measured.

No marks should be awarded for 'burning' since the word ‘burned’ appears in the text.

(p) Unless the question is clearly about a non-chemistry issue, eg costs in industrial chemical process, a non-chemical answer gains no marks.

Example: Suggest why the (catalytic) converter has a honeycomb structure.

A response such as ‘to make it work’ may be correct but it is not a chemical answer and the mark should not be awarded.