Course report 2023

National 5 Design and Manufacture

This report provides information on candidates' performance. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report is intended to be constructive and informative, and to promote better understanding. You should read the report in conjunction with the published assessment documents and marking instructions.

The statistics in the report were compiled before any appeals were completed.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2022: 4,414

Number of resulted entries in 2023: 4,260

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	975	Percentage	22.9	Cumulative percentage	22.9	Minimum mark required	122
B	Number of candidates	1,123	Percentage	26.4	Cumulative percentage	49.2	Minimum mark required	101
C	Number of candidates	1,169	Percentage	27.4	Cumulative percentage	76.7	Minimum mark required	81
D	Number of candidates	692	Percentage	16.2	Cumulative percentage	92.9	Minimum mark required	60
No award	Number of candidates	301	Percentage	7.1	Cumulative percentage	100	Minimum mark required	N/A

Please note that rounding has not been applied to these statistics.

You can read the general commentary on grade boundaries in the appendix.

In this report:

- ‘most’ means greater than 70%
- ‘many’ means 50% to 69%
- ‘some’ means 25% to 49%
- ‘a few’ means less than 25%

You can find more statistical reports on the statistics and information page of SQA’s website.

Section 1: comments on the assessment

Question paper

The question paper performed largely as expected.

Assignment — design

The assignment — design performed as expected and allowed candidates to access the full range of marks.

Most candidates chose brief 1 (gaming accessory holder) or brief 2 (hairstyle accessory holder). Some candidates chose brief 3 (pet accessory holder). Each task generated a wide range of responses and marks.

Assignment — practical

The assignment — practical is marked by teachers and lecturers in centres and verified by SQA visiting verifiers.

The assignment — practical performed as expected and gave candidates the opportunity to demonstrate the skills, knowledge, and understanding they gained in the course. The assignment — practical generated a wide range of candidate evidence. Most of the assignments that were verified had been fully completed by candidates.

Most centres' assessment judgements were valid. A few centres were severe or lenient with their assessment judgements, which they addressed during visiting verification.

Section 2: comments on candidate performance

Areas that candidates performed well in

Question paper

Question 1(a)(i)

Most candidates answered this question correctly and showed a good knowledge of softwoods.

Question 1(b)(iv)

Most candidates answered this question correctly and showed a good knowledge of the use of PVA glue.

Question 1(c)(ii)

Most candidates answered this question well and showed a clear understanding of how to mark out centre lines on metal.

Question 1(e)(i)

Most candidates answered this question correctly and showed a clear understanding of how to prevent acrylic from cracking during drilling.

Question 1(e)(iii)

Most candidates answered this question correctly and showed a good understanding of why to drill before bending.

Question 3(b)

Most candidates answered this question correctly and showed a good knowledge of idea generation techniques.

Question 4(a)

Most candidates answered this question well and showed a clear understanding of why sketching is a suitable graphic technique to use when generating ideas.

Question 4(c)

Most candidates answered this question well and showed a clear understanding of the benefits of using physical models during the design process.

Question 7(b)

Most candidates answered this question well and showed a clear understanding of the benefits of a strong brand image.

Question 8(a)(ii)

Most candidates answered this question correctly and showed a clear understanding of the suitability of plastics for use in the tap.

Assignment — design

Specification

Most candidates achieved full marks for this section for drawing an appropriate number of points from the brief and given research. Many candidates effectively used the conclusion statements in the research as their specification points.

Idea generation

Many candidates generated a range of creative ideas, clearly aimed at the task.

Refinement

Many candidates produced good evidence of refinement. Most candidates concentrated on the refinement required for manufacture, for example dimensions, materials, manufacturing techniques, and assembly.

Graphic techniques

Many candidates demonstrated a good level of skill with graphic techniques and used graphic techniques appropriate to the stage of the design process.

Planning for manufacture

Most candidates produced good evidence across all three areas of the pro forma.

Assignment — practical

This year's candidates provided a good range of evidence in response to the three design briefs. Many candidates produced work that demonstrated high levels of practical skill.

Many candidates produced very strong evidence of creative solutions. More candidates than in previous years used more than one material in their assignments.

Areas that candidates found demanding

Question paper

Question 1(a)(ii)

This question asked candidates to name the drill bit suitable for drilling a flat-bottomed hole. Many candidates did not provide the correct answer, 'Forstner bit', which is referenced in the course specification.

Question 1(d)(ii)

This question asked candidates to name two processes that would be carried out on the centre lathe to create the turned piece. Many candidates did not name the two processes correctly, which suggests that they were unfamiliar with them.

Question 1(d)(iii)

This question asked candidates to describe two ways of ensuring a good quality thread is cut. Many candidates did not gain any marks, which suggests that they were unfamiliar with this process.

Question 1(d)(iv)

This question asked candidates to name an adhesive suitable for permanently joining the moon to the bar. Most candidates gave the correct answer, ‘epoxy resin’, which is referenced in the course specification.

Question 4(b)

This question asked candidates to outline two reasons why a designer would use working drawings. Many candidates only outlined one reason.

Question 7(a)

This question asked candidates to describe how the clocks compared aesthetically. Many candidates missed out on marks because, although they used the correct terminology to describe aesthetics, they did not compare the clocks.

Question 8(d)

This question asked candidates to outline two reasons why die casting is a suitable process for mass manufacturing the metal taps. Many candidates did not give two reasons that were different to the answers they had given for question 8(c). (Question 8(c) asked about the identifying features of injection moulding.)

Question 8(e)

This question asked candidates to name an appropriate process to manufacture the thermoplastic tank and to state why the process was suitable. Many candidates did not name rotational moulding as the appropriate process and, so, did not state why it was suitable.

Question 10

This question asked candidates to outline the benefits of using standard components to the manufacturer. Many candidates referenced the general benefits of standard components but did not always outline the benefits in terms of the manufacturer.

Question 11

This question asked candidates to outline three steps that manufacturers could take to extend the life expectancy of a product. Many candidates did not gain marks here because they gave generic answers relating to environmental concerns.

Assignment — design

Exploration

Some candidates did not produce evidence of meaningful exploration.

More candidates than last year attempted to explore ideas visually. Some candidates, however, did not clarify the opportunities or drawbacks of the options they considered.

Modelling

Some candidates did not produce models or produced simple models, without detail or annotation to clarify their purpose. These models gained few or no marks.

Assignment — practical

Candidates demonstrated a wide range of ability across all of the assessable skills.

This year's evidence suggests that candidates did not find any of the areas of the assignment — practical more demanding than the others, although some candidates produced solutions that were very simple.

Section 3: preparing candidates for future assessment

Question paper

Teachers and lecturers should use the materials on SQA's website when preparing candidates for the question paper, for example the specimen question paper, past question papers, and marking instructions.

Candidates should work through question papers that are similar in style to the National 5 question paper. Teachers and lecturers could talk through the marking instructions with candidates as they complete each question. Candidates can use answering techniques to ensure their responses gain marks. Candidates can practise these to prepare for the final exam.

It is good practice for candidates to respond in sentence format rather than single-word answers. Single-word answers can gain marks where the command word is 'name' or 'state', but for 'outline', 'describe', or 'explain' questions, candidates need to give some degree of description or explanation.

Low-level, unqualified responses such as 'quick', 'easy', and 'cheap', do not display the required knowledge and understanding. Candidates must demonstrate a deeper understanding and qualify their responses to gain marks.

The course specification contains a table with the skills, knowledge and understanding required for the course assessment. This table contains the areas that the question paper samples. Teachers and lecturers should share this table with candidates, so they are familiar with these areas before the exam.

The course specification includes an appendix with course support notes. This contains suggested activities and approaches to develop knowledge and understanding that could help candidates prepare for the exam.

Assignment — design

Candidates should understand the skills and knowledge the assignment — design assesses. Teachers and lecturers should give candidates access to the full coursework assessment task document. This will allow them to clarify any issues or concerns they may have before starting the assessment.

Candidates can also use the data booklet (available on SQA's website) during their assignment. It is good practice to share exemplification materials with candidates before they attempt the coursework assessment task. Updated examples of evidence with marking commentaries are available on SQA's Understanding Standards website. An updated audio presentation, including guidance on the research section will be available during session 2023–24.

Assignments must not exceed seven A3 sheets (or equivalent), including the research pro forma and the planning for manufacture pro forma. This volume of evidence allows candidates to comfortably access the full range of marks available in assignments.

Centres should submit candidates' original work rather than photocopies or photographs. Original work is easier for markers to work with. If centres retain a record of candidates' work, they should keep photocopies.

Teachers and lecturers should ensure that all work candidates submit is their own. Teachers and lecturers should work with the centre's support department to ensure they are meeting candidates' additional support needs within the assessment conditions.

This course will return to full assessment requirements from session 2023–24 onwards. This means the assignment — design will be worth 55 marks and will assess candidates' research skills.

Teachers and lecturers should ensure that candidates are fully prepared and have the necessary skills before starting the assignment.

Advice for teachers and lecturers about sections of the assignment — design

- Candidates' research should be relevant to their chosen brief. Candidates should research a range of design issues, using a range of valid research techniques. Candidates cannot gain marks for responses that only state their opinion.
- The specification should contain all points drawn from the chosen brief and a range of valid points drawn from the candidate's research. The specification should be detailed, including information that will allow effective refinement later in the design process. Candidates cannot gain marks for specification points based on their opinion.
- Candidates' ideas should aim to address the chosen brief. They can communicate their ideas using graphics, models, or annotations. Generic shapes or objects with no clear function cannot gain marks. Copies of existing products cannot gain marks. Candidates should aim to have a range of ideas, with clear differences between each idea.
- When exploring their design, candidates should clearly communicate the alternatives they are considering (using graphics, modelling, or annotations) and the opportunities or drawbacks of each option for their design.
- To fully refine their proposal, candidates should communicate how they will meet their specification points and their decisions relating to the planning for manufacture (for example materials, dimensions, manufacturing techniques, and assembly).
- Candidates should demonstrate their knowledge of design issues and materials and manufacturing through supporting annotations, graphics, and/or modelling. By exploring alternatives and refining their design proposal to meet their specification, candidates can demonstrate their knowledge across many areas relating to design and manufacturing.
- Candidates should use a range of graphic and modelling techniques throughout the design process to generate ideas, explore alternatives to find the best solutions, and refine their design to meet the specification and plan for manufacture.
- Candidates should ensure the information on their planning for manufacture pro forma is clear, links across all sections, and communicates the information required to manufacture their final design.

Assignment — practical

Teachers and lecturers should remind candidates of the importance of designing a proposal with a level of complexity that allows them to demonstrate their practical skills.

Appendix: general commentary on grade boundaries

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

For most National Courses, SQA aims 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 is very challenging to get the standard on target every year, in every subject at every level. Therefore, SQA holds a grade boundary meeting for each course to bring together all the information available (statistical and qualitative) and to make final decisions on grade boundaries based on this information. Members of SQA's Executive Management Team normally chair these meetings.

Principal assessors utilise their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. SQA 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.

- The grade boundaries can be adjusted downwards if there is evidence that the question paper or other assessment has been more difficult than usual.
- The grade boundaries can be adjusted upwards if there is evidence that the question paper or other assessment has been less difficult than usual.
- Where levels of difficulty are comparable to previous years, similar grade boundaries are maintained.

Grade boundaries from question papers in the same subject at the same level tend to be marginally different year on year. This is because the specific questions, and the mix of questions, are different and this has an impact on candidate performance.

This year, a package of support measures was developed to support learners and centres. This included modifications to course assessment, retained from the 2021–22 session. This support was designed to address the ongoing disruption to learning and teaching that young people have experienced as a result of the COVID-19 pandemic while recognising a lessening of the impact of disruption to learning and teaching as a result of the pandemic. The revision support that was available for the 2021–22 session was not offered to learners in 2022–23.

In addition, SQA adopted a sensitive approach to grading for National 5, Higher and Advanced Higher courses, to help ensure fairness for candidates while maintaining

standards. This is in recognition of the fact that those preparing for and sitting exams continue to do so in different circumstances from those who sat exams in 2019 and 2022.

The key difference this year is that decisions about where the grade boundaries have been set have also been influenced, where necessary and where appropriate, by the unique circumstances in 2023 and the ongoing impact the disruption from the pandemic has had on learners. On a course-by-course basis, SQA has determined grade boundaries in a way that is fair to candidates, taking into account how the assessment (exams and coursework) has functioned and the impact of assessment modifications and the removal of revision support.

The grade boundaries used in 2023 relate to the specific experience of this year's cohort and should not be used by centres if these assessments are used in the future for exam preparation.

For full details of the approach please refer to the National Qualifications 2023 Awarding — Methodology Report.