



Course report 2024

National 5 Practical Metalworking

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 with the published assessment documents and marking instructions.

We compiled the statistics in this report before we completed the 2024 appeals process.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2023: 1,709

Number of resulted entries in 2024: 1,776

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	406	Percentage	22.9	Cumulative percentage	22.9	Minimum mark required	70
B	Number of candidates	474	Percentage	26.7	Cumulative percentage	49.5	Minimum mark required	60
C	Number of candidates	431	Percentage	24.3	Cumulative percentage	73.8	Minimum mark required	50
D	Number of candidates	243	Percentage	13.7	Cumulative percentage	87.5	Minimum mark required	40
No award	Number of candidates	222	Percentage	12.5	Cumulative percentage	100	Minimum mark required	N/A

We have not applied rounding 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 statistical reports on the [statistics and information](#) page of our website.

Section 1: comments on the assessment

Question paper

Feedback received indicated that the question paper was fair in terms of course coverage and the overall level of demand. The question paper discriminated effectively between candidates.

As in previous cohorts where the question paper was an assessable course component, candidate performance in the question paper was poorer than in the practical activity. The marking team noted that a number of candidates failed to demonstrate a basic knowledge of practical metalworking processes. Centres are reminded that all content defined in the knowledge and understanding tables for the question paper in the course specification can be assessed.

Practical activity

The practical activity assessment task (garden lantern) once again functioned as intended. It provided the opportunity for candidates to demonstrate different levels of performance across the full range of marks available. Generally, candidates appeared to have prepared well, and the majority attempted all sections of the practical activity in relation to the marking instructions.

Section 2: comments on candidate performance

Question paper

Areas that candidates performed well in

Well-prepared candidates who demonstrated knowledge and understanding of practical metalworking skills gained marks in the upper range. The most successful candidates fully developed and justified their comments to gain maximum marks.

- Question 1(b): Most candidates were able to correctly match the type of property from the given list with the description of the property in the table.
- Question 1(g): The majority of candidates were able to correctly name the machine shown in the image provided.
- Question 1(k)(ii): Most candidates were able to correctly identify the image of the digital micrometer which displayed the correct tolerance reading.
- Question 2(a)(i): Most candidates were able to state the correct use of the 'continuous thick line'.
- Question 2(a)(ii): Most candidates were able to correctly state the name of one piece of personal protective equipment that should be worn when handling sheet metal.
- Question 2(a)(iii): Most candidates were able to identify the correct order by completing the table in regard to preparing and marking out the lamp.
- Question 3(c)(ii): Most candidates were able to correctly calculate the length of 'dimension x' in relation to the sundial drawing.
- Question 3(c)(iii): Most candidates were able to correctly calculate the minimum width of the slot required to join the pointer to the base, in relation to the sundial drawing.

Areas that candidates found demanding

Many candidate responses to 'explain' and 'describe' questions were too short and lacked the detail required to gain marks; this was similar to question papers from previous years.

Many candidates could not apply the correct names to tools and equipment within the question paper.

- Question 1(c)(i): Almost all candidates could not correctly name the tool shown in the image provided.
- Question 1(c)(ii): Most candidates could not correctly explain why the tool should be moved in the direction shown by the arrow in the image provided.
- Question 1(d): Almost all candidates could not correctly explain why a datum line is used when measuring and marking.
- Question 1(h): Most candidates could not correctly name parts of the machine shown in the image provided.
- Question 1(m): Most candidates could not correctly state two possible reasons why a hole could be drilled too large in a piece of metal.
- Question 1(n): Almost all candidates could not correctly name the tool shown in the image provided.

Question 2(c)(i):	Almost all candidates could not correctly explain the purpose of annealing metal.
Question 2(c)(ii):	Almost all candidates could not correctly explain why soap is rubbed onto the surface of aluminium during the annealing process.
Question 2(d)(ii):	Most candidates could not correctly explain why a pop rivet was used to join the lamp based on the image provided.
Question 2(e)(i):	Most candidates could not correctly describe a simple test used to separate aluminium from mild steel as part of the recycling process.
Question 2(e)(ii):	Most candidates could not correctly explain two reasons why upcycling aluminium benefits the environment.
Question 3(a)(ii):	Most candidates could not correctly name the heat treatment process that could be applied to the metal to reduce the brittleness.
Question 3(e):	Most candidates could not correctly describe the process of powder dip coating.

Practical activity

Log book

Candidates tended to score either very high marks or very few marks in the 'Machine care and maintenance' and 'Tool care and maintenance' sections.

The majority of candidates were awarded full, or almost full, marks for safe working procedures. The majority of candidates adhered to safe working procedures, without any need for reminders or interventions.

Bench work

Candidates showed good skills in measuring and marking out in terms of bench work. Although this area is more difficult to verify, assessor commentary confirmed that a majority of candidates were able to carry out these tasks appropriately and within tolerance.

Most candidates did not gain full marks for 'Cutting, shaping and forming — not machined parts', because they did not keep within their marking out lines. Most of the candidates who did not achieve full marks had removed too much material from the components, rather than removing too little material. Most candidates did not achieve the correct tolerances in some dimensions for the handle support, the air vent component, and the apertures in both the lid and base components. In particular, candidates struggled with shaping the chamfers and radius of the handle supports and the radii on the air vent.

Machining

The lathe work of most candidates was good, with the best work displaying linear dimension accuracy after facing off, especially on the overall length of the legs and the handle. Some candidates had difficulty with meeting the required tolerance for the 14 mm linear length on the handle, and some candidates had missed cutting the 3 x 45° chamfers on the handle.

Some candidates had difficulty with 'Lathe work — quality of work'. Knurling was evident in the majority of candidates' work, but few managed to repeat the quality of a knurl on the

handle and feet components. Most candidates completed the tapers on the handle to a good standard and were able to machine to the tolerances required.

Most candidates showed good skills in machine drilling on the centre lathe, especially when positioning and aligning the holes. Very few candidates achieved full marks for 'Machine drilling — lathe and pedestal/pillar drill', as they were not able to machine-drill holes accurately using the pedestal/pillar drill. Many candidates did not deburr the machine-drilled holes.

Fabrication

Internal threading, in terms of both size and quality, continues to be the area that candidates perform well in. Where candidates used aluminium feet, there was more of a tendency for the external threads to be uneven and misshapen.

Pop riveting was completed well by the candidates who were able to evidence this technique. Some candidates did not follow the instructions on the drawings provided and used snap head rivets instead of pop rivets to join the air vent to the lid. The fold joints on the tray showed good evidence of being crease free, consistent and parallel, which was a continued improvement this year.

Thermal joining is a more demanding aspect of the assessment, and candidates completed it to a similar standard to last session — which was an improvement compared to most of the previous years. Most centres had chosen welding as their method of thermal joining and importantly, most candidates did well in terms of ensuring that welds were not ground down.

Finishing

Again, this year most candidates' standard of finishing was very poor. Candidates made the components worse by adding unnecessary processing marks to them, for example chuck marks for lathe work, engineers vice marks or scribing too heavily when marking out. Some candidates did not attempt to finish any of the components of the practical activity.

Overall assembly

Candidates who completed the assessment assembled the garden lanterns very well and were awarded high marks in this area. Most of these candidates demonstrated their ability to manufacture individual components to a good standard and within tolerance. This contributed to the majority of functional sizes being well within tolerance and the product being properly assembled.

It was noted during verification procedures that an increased number of candidates did not complete all components and therefore, did not provide a full, or even partial, assembly.

Section 3: preparing candidates for future assessment

Question paper

Candidates need to be better prepared for the types of questions asked in the National 5 question paper.

Command words are the verbs or verbal phrases used in questions and tasks to ask candidates to demonstrate specific skills, knowledge or understanding. Candidates should be aware of the differences between command words; in particular 'name', 'state', 'explain' and 'describe', and the level of responses required in relation to these command words.

Teachers and lecturers must ensure that they teach all aspects of skills, knowledge and understanding listed in the 'Skills, knowledge and understanding for the course assessment' section of the course specification on the [Practical Metalworking subject page](#) of SQA's website. Candidates need to have a better knowledge of the names of tools, equipment (and their associated parts) and processes listed in the course specification. It may be the case that centres do not have all the necessary equipment to teach these skills practically, however other approaches must be used to ensure candidates gain knowledge in these areas. It may be beneficial to give a copy of the course specification to candidates because it lists the skills, knowledge and understanding required for the question paper.

Teachers and lecturers could encourage their candidates to support their responses with sketches, where appropriate. Some candidates found it challenging to fully articulate some of their responses and this approach may help, particularly for 'describing' questions focusing on using tools and processes. Teachers and lecturers should remind candidates that while they can use pencil to construct a sketch, any final sketch to support a response should be in blue or black ink.

The best possible preparation for the question paper is to give candidates the opportunity to work through question papers of a similar nature. Teachers and lecturers should talk through the marking instructions with candidates as they complete each question.

Understanding Standards materials are available on [SQA's website](#). These include evidence of candidate responses, together with commentaries on why candidates were or were not awarded marks. This is a useful source of information for preparing candidates for future assessments.

Practical activity

Materials on SQA's [Understanding Standards website](#) can be viewed and used by candidates, assessors and internal verifiers before beginning the practical activity. This will help ensure that all stakeholders are aware of the standards required at National 5 level when working on this practical activity, whether it be during the process of gathering evidence, assessing or internally verifying.

Centres that were fully accepted for their assessment judgements followed good practice by using SQA's Understanding Standards materials. They also followed good practice by giving

the assessor time to talk through the practical activity documentation before starting to gather evidence. Candidates need to be informed of assessment conditions and know what they should do to complete the practical activity.

Candidates should correctly follow the information on the drawings regarding joining methods. Centres must ensure they have all the necessary materials before beginning the practical activity and are following the instructions given in the practical activity, ie if the practical activity states that pop rivets should be used then centres should not issue any other type of rivet to candidates.

Centres are reminded that they must try to obtain the material thicknesses as specified in the assessment task. Only in circumstances where specified material cannot be sourced, can centres adapt working drawings and issue a different thickness of material. Centres do not need to inform SQA if a change in material thickness is necessary. Centres are reminded that any change of material thickness that changes the validity or fairness of the assessment will result in the centre being issued with a Not Accepted Outcome in terms of SQA visiting verification procedures and may affect candidates' overall results.

Independence of work is seen as a method of differentiation among candidates, recognising the ability of candidates to apply the knowledge gained from teaching and learning in the completion of the practical activity with varying degrees of additional assistance, ranging from none to constant. The mark a candidate receives for independence of work should reflect both the quantity and the quality of the work produced. Please refer to [SQA's Understanding Standards website](#) for further information on independence of work.

Candidates must only use the tools, machinery and equipment listed in the practical activity section of the course specification when carrying out the practical activity. For example, candidates must not use the milling machine or grinders for any part of the practical activity coursework assessment task.

Candidates must ensure that the candidate log book is focused more on the care and maintenance of machinery and tools rather than processes being carried out. Machinery such as grinders, and tools such as coping saws, which are not in the practical activity section of the course specification, should not be used in the log book and will not be awarded any marks when assessing.

The log book can be completed at any time throughout the duration of the course and does not need to be completed in tandem with the practical activity model. The log book can be hand written or electronically produced, it can be enlarged in total, or the size of individual boxes can be adjusted, but it must remain in the same format as issued. A link to the specimen log book is available on the [Practical Metalworking subject page](#) on SQA's website.

Alternative assessment arrangements can be used to support candidates when they are generating evidence for the practical activity. This may be especially important in the log book area.

After marking out, candidates need to focus on ensuring that they are cutting and shaping within their marking out lines. For example, when filing to a marked line which has already

been marked out accurately to tolerance, candidates should be removing material and checking sizes constantly to ensure they remain within tolerance.

Candidates should know that work-holding to complete a component or assembly can potentially damage finished work in terms of either deforming the work or adding blemishes or scratches. Candidates should be planning and problem solving to ensure they know how to manufacture or assemble components from start to finish.

Candidates should be well prepared in checking and then using cutting tools which are sharp enough to complete tasks to the required tolerances. Candidates should be trained to check drill bits, lathe cutting tools, bench tools etc and rectify any issues before using them to manufacture their components.

Candidates should be aware of dimension techniques with regards to threads. Within the practical activity drawings, it is the depth of the thread that is the assessable element and not the depth of the hole, ie holes should be drilled to an appropriate depth to allow for accurate threading to the required dimensions.

Candidates should be advised before assessment takes place, of the standard of finish required at National 5 level, for example, deburring and polishing component parts to remove scratches and process marks. If no attempt has been made by the candidate to prepare the components for a finish, then no marks should be awarded in this area.

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.

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.

During the pandemic, we modified National Qualifications course assessments, for example we removed elements of coursework. We kept these modifications in place until the 2022–23 session. The education community agreed that retaining the modifications for longer than this could have a detrimental impact on learning and progression to the next stage of education, employment or training. After discussions with candidates, teachers, lecturers, parents, carers and others, we returned to full course assessment for the 2023–24 session.

SQA's approach to awarding was announced in [March 2024](#) and explained that any impact on candidates completing coursework for the first time, as part of their SQA assessments, would be considered in our grading decisions and incorporated into our well-established

grading processes. This provides fairness and safeguards for candidates and helps to provide assurances across the wider education community as we return to established awarding.

Our approach to awarding is broadly aligned to other nations of the UK that have returned to normal grading arrangements.

For full details of the approach, please refer to the [National Qualifications 2024 Awarding — Methodology Report](#).