



## Course report 2019

Subject	Practical Metalworking
Level	National 5

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. It would be helpful to read this report in conjunction with the published assessment documents and marking instructions.

The statistics used in this report have been compiled before the completion of any post-results services.

# **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 2018, 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; however, improvement was noted with regard to candidates' use of correct terminology for tools and equipment. 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 task, once again, performed appropriately as a final assessment.

The majority of centres made fair and accurate assessment judgements within marking tolerances. Most centres marking outwith these tolerances were lenient in their application of marks.

## Section 2: comments on candidate performance

### Areas that candidates performed well in

#### Question paper

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 2(a) (ii):** The vast majority of candidates were able to state the correct outside diameter of the baton.

**Question 2(e):** The majority of candidates were able to state two properties of aluminium that made it a suitable material for the baton. The most common answers were references to aluminium having a good strength to weight ratio and that it does not rust.

**Question 3(c) (ii):** The majority of candidates were able to describe the correct purpose of the tool shown.

**Question 3(d):** The majority of candidates were able to describe the correct purpose of the tool shown, but less than half were able to state the name of the tool as per the previous question.

**Question 3(e):** The vast majority of candidates were able to correctly name one safety precaution when clearing swarf after drilling.

**Question 3(f) (i):** The vast majority of candidates were able to give one reason why paint was a suitable finish for the centre finder. The most common answers were references to avoiding rusting/markings/staining.

**Question 3(g) (i):** The majority of candidates were able to correctly identify which reading on the digital calipers was correct. Candidates performed better than expected on this question.

**Question 3(g) (ii):** The vast majority of candidates were able to correctly identify which reading on the digital calipers was correct. Candidates performed much better than expected on this question.

**Question 4(d):** The vast majority of candidates were able to correctly state two safety checks that should be carried out on a pedestal/pillar drill prior to switching it on.

#### Practical activity

The majority of candidates were awarded full or almost full marks for safe working procedures. It is very pleasing to note that candidates are adhering to safe working procedures, without any need for reminders or interventions. This will assist candidates as they move into further education or the world of work, to help prevent injury to themselves, or others.

Candidates demonstrated skills in measuring and marking out in terms of bench work. Assessor commentary confirmed that a majority of candidates were able to carry out these tasks appropriately and within tolerance.

Once again this session, candidates' lathe work was good in a number of areas, with the best work displayed in linear dimension accuracy after facing off — especially on the overall length of the legs, overall length of the handle and overall length of the feet. The majority of candidates who had completed knurling had done so to a good standard, with only a small minority then deforming the knurl by closing too forcefully in vice or chuck.

Once again the majority of candidates showed skills in machine drilling on the lathe and pedestal/pillar drill, especially when positioning and aligning the holes. (Accurate measuring and marking out, especially for the pedestal/pillar drill, helped this.) However, on a number of holes, no deburring had taken place.

Candidates who completed the assessment assembled the artefacts excellently. The majority 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 also being well within tolerance and the product being properly assembled.

As a whole, candidates appear to have prepared well for the practical activity. The performance by candidates demonstrated that centres were covering the majority of course content areas sufficiently.

## **Areas that candidates found demanding**

### **Question paper**

Some candidate responses to 'explain' and 'describe' questions were too short and lacked the detail required to gain marks; this was similar to the 2018 question paper.

**Question 2(g):** Few candidates were able to correctly explain why a 'plug tap' is used when creating an internal thread on a blind hole.

**Question 2(k) (i):** Few candidates were able to correctly name the tool shown. Incorrect terminology was used with many candidates giving a similar or the same answer to both Question 2(k) (i) and 2(k) (ii).

**Question 4(c):** Very few candidates were able to correctly state the name of the process shown.

**Question 4(e):** Few candidates were able to correctly describe how to remove a jagged edge from the hole, as shown in the image. Many candidates answered similarly in this question but gave a statement rather than a description as asked.

**Question 4(f):** Very few candidates were able to correctly describe the process of brazing. This question had the second highest no answer rate across the question paper.

**Question 4(g):** Very few candidates were able to correctly describe the process of bluing. This question had the highest no answer rate across the question paper.

**Question 4(h) (i):** Few candidates were able to correctly name the type of rivet shown, with many candidates attempting the question but using the incorrect terminology. A similar question was in the 2018 question paper.

**Question 4(h) (ii):** Very few candidates were able to correctly describe the process of riveting.

### **Practical activity**

Fabrication work in terms of folded joints and welded joints was not answered well by a number of candidates, and this was reflected in candidates' marks for this area. Folded joints were uneven and not parallel and, in many cases, the overall dimensions of the tray component of the garden lantern project were well outwith tolerance. Welding continues to be a demanding area for candidates. The consistency of run over length of joint was the most difficult aspect for candidates. A number of components featured weld spatter and evidence of burning. Across a number of fusion joints, the joined components were not square.

Although candidates performed well in cutting using bench tools, the standard of finish on these areas was generally poorly completed, with many candidates leaving heavy burrs and unpolished faces on many parts.

The standard of finish, in general, was very poor in a number of the candidates sampled. This could have been caused either by candidates not having enough time to complete the project or not being properly prepared for finishing metal. Candidates did not take the time to emery cloth or polish faces on the lid and base plate for example.

The area of machining that candidates found demanding was taper turning. Generally this was uneven or outwith tolerance. The marking instructions for this area allow assessors to differentiate between stronger and weaker candidates.

Some candidates found it challenging to replicate good quality work, for example turning the tapers on the garden lantern handle, or joining the handle supports to the lid. In instances like this, assessors should award marks according to the marking instructions.

## **Section 3: preparing candidates for future assessment**

### **Question paper**

Teachers and lecturers should ensure they are familiar with the past paper marking instructions, which are published annually on SQA's website.

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. 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 component.

Teachers and lecturers should encourage candidates to respond in sentence format rather than in single-word responses. Single-word responses can gain marks where the command word is 'state' or 'name', but if 'describe' and 'explain' are used, a description or explanation is required.

To prepare future candidates 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.

Candidates should use the correct terminology, as detailed in the National 5 Practical Metalworking Course Specification. This will help ensure that they are gaining the maximum amount of marks available to them.

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.

### **Practical activity**

Assessors are reminded that candidates must not be awarded full marks in any section where evidence from that section is incomplete. For example, if the tray is missing from the garden lantern practical activity, then the candidate cannot achieve full marks in either the bench work or fabrication sections of the marking instructions. Furthermore, candidates cannot achieve full marks in the independence of work area within these sections. This issue is covered in both the Qualification Verification Summary Report and material from Understanding Standards website.

While assessors can give candidates support and guidance, where they provide any significant amount of support, it must be reflected in the marks awarded.

The practical activity is designed to discriminate between candidates, so there will be a wide range of marks across a class. Stronger candidates should be able to complete the practical activity successfully with minimal support and guidance. Weaker candidates may not be able to complete all aspects of the assignment within a reasonable time, or may require significant assistance, and so would achieve a lower mark. Once the practical activity has been completed and assessed, it cannot be returned to the candidate for further work to improve their mark.

In terms of the log book, the majority of centres used the example logbook on SQA's website. Others added sufficient detail to the entries in their logbook to explain exactly which checks they would carry out pre- or post-tool/machine use. These checks must be specific to the machine or tool chosen, and fully describe how processes were carried out.

Teachers and lecturers should continue to focus on the log book and ensure that candidates know to complete it. The information in the log book should be clear and in candidates' own words and focus on the specific tool or machine used. Teachers and lecturers should refer to the exemplar log book on SQA's website and the relevant Understanding Standards materials. The log book can be completed throughout the course and not just while working on the course assessment task.

Teachers and lecturers should ensure that candidates 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.

Teachers and lecturers should ensure that candidates understand the importance of finishing work to a high standard, including spending time deburring and removing blemishes and scratches. This is a very important part of the process and candidates should allocate time for this.

Teachers and lecturers should advise candidates to take great care with their components at all times and to ensure that tools are set correctly, have no defects, and are of the correct quality to complete the task. The majority of unnecessary blemishes or scratches on components this year were likely caused by tooling issues, care of components, or lack of time spent finishing the components to an appropriate level. It is the candidate's responsibility to recognise when tools or equipment need to be adapted or rectified, even if they do not carry out this procedure by themselves.

Teachers and lecturers should note that if candidates apply a finish (internal or external) to the completed practical activity artefact, it could lead to a 'Not Accepted' decision being made at verification.

The practical activity does not need to be completed within a set timescale and should be started at an appropriate point in the course, once all content has been delivered.

Assessor commentary is essential to support both the internal and external verification processes as it explains where marks have been awarded (or not), especially if the candidate has made a mistake in the marking-out stage.

For National 5 a tolerance of  $\pm 0.5\text{mm}$  is applied to the overall size. Where centres changed some of the thicknesses of the materials they supplied to candidates, the overall sizes were not altered on the working drawing, resulting in candidates being outwith this tolerance. If thicknesses are amended, all subsequent sizes must be altered to reflect these changes.



## Grade boundary and statistical information:

### Statistical information: update on courses

Number of resulted entries in 2018	1259
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Number of resulted entries in 2019	1267
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### Statistical information: performance of candidates

#### Distribution of course awards including grade boundaries

Distribution of course awards	Percentage	Cumulative %	Number of candidates	Lowest mark
<b>Maximum mark</b>				
<b>A</b>	36.7%	36.7%	465	70
<b>B</b>	27.9%	64.6%	353	60
<b>C</b>	18.1%	82.6%	229	50
<b>D</b>	9.2%	91.8%	116	40
<b>No award</b>	8.2%	-	104	-

## General commentary on grade boundaries

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

SQA aims to set examinations and create marking instructions that allow:

- ◆ a competent candidate to score a minimum of 50% of the available marks (the notional C boundary)
- ◆ a well-prepared, very competent candidate to score at least 70% of the available marks (the notional 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 every year for each subject at each level to bring together all the information available (statistical and judgemental). The principal assessor and SQA qualifications manager meet with the relevant SQA head of service and statistician to discuss the evidence and make decisions. Members of the SQA management team chair these meetings. SQA can adjust the grade boundaries as a result of the meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper has been more, or less, challenging than usual.

- ◆ The grade boundaries can be adjusted downwards if there is evidence that the question paper is more challenging than usual.
- ◆ The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual.
- ◆ Where standards 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 to year. This is because the particular questions, and the mix of questions, are different. This is also the case for question papers set by centres. If SQA alters a boundary, this does not mean that centres should necessarily alter their boundary in the question papers that they set themselves.