



Course Report 2018

Subject	Design and Manufacture
Level	National 5

This report provides information on the performance of candidates. 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

Summary of the course assessment

Component 1: question paper

The question paper consists of two sections totalling 80 marks and was structured the same way as the specimen question paper.

Section 1 Question 1 examined materials and manufacturing processes in a workshop setting. All the question in this section centred around one product based on a set of educational scales this year. This question had a total of 30 marks.

Questions 2–7 examined knowledge and understanding of design issues, broadly following the design process with a different focus in each question. These questions totalled 30 marks.

Section 2 Questions 8–11 examined knowledge and understanding of commercial manufacturing with a different focus in each question. These questions totalled 20 marks.

The question paper was slightly more demanding than anticipated for candidates. As a result of this, the grade boundary was lowered.

Component 2: assignment — design

The assignment - design component was allocated a total of 55 marks. The tasks for the assignment were set and assessed by SQA. Candidates undertook one task from a bank of three. All tasks performed well and allowed candidates to access the full range of marks. Most candidates chose the organiser task. All tasks generated a wide range of responses and marks.

Component 3: assignment — practical

This component is internally marked by centres and verified by SQA visiting verifiers. There was no change to the assignment and it performed as expected, giving candidates full opportunity to demonstrate the skills, knowledge and understanding they had gained in the course. A wide range of evidence was generated and all assignments which were verified had been fully completed.

Section 2: comments on candidate performance

Areas in which candidates performed well

Component 1: question paper

Candidates performed well in some parts of question 1 as well as the questions focusing on design factors later in the paper.

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| Question 1(a) (ii) | Many candidates made good use of the optional space for sketches of their chosen joining method. |
| Question 1(b) (iii) | Most candidates showed a good knowledge of machine tools used to form curves in wood. |
| Question 1(c) (ii) | Most candidates showed a good knowledge of hand tools used to cut curves in wood. |
| Question 1(d) | Most candidates showed a clear understanding of the manufacture of a housing joint. |
| Question 1(f) (iv) | Most candidates showed a clear understanding of the edge finishing of acrylic. |
| Question 1(g) (iv) | Most candidates showed a good knowledge of hand tools used to cut straight lines in metal. |
| Question 6(a) (i) | Most candidates showed a clear understanding of how the function of the backpacks was influenced by the target market. |
| Question 6 (a) (ii) | Most candidates showed a clear understanding of how the aesthetics of the backpacks were influenced by the target market. |
| Question 6 (b) | Most candidates showed a clear understanding of marketing techniques. |

Component 2: assignment — design

There was a wide range of performance:

- ◆ Analysing the brief: Candidates generally performed well in analysing the brief and made a good attempt at completing the research pro forma and specification.
- ◆ Using graphics: Candidates generally used graphics well to communicate throughout the assignment.
- ◆ Planning for manufacture: Candidates generally performed well in producing the plan for manufacture. Almost all candidates completed the pro forma section with sufficient information and clarity.

Component 3: assignment — practical

Candidates generally produced good evidence for all sections with the exception of section 5: evaluating.

Areas which candidates found demanding

Component 1: question paper

Most candidates found the following questions demanding:

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| Question 1(b) (ii) | The expected response was 'forstner bit' which is included in the course specification. |
| Question 1(c) (iii) | This question asked 'why wax would have been used instead of varnish' but many candidates gave generic reasons for finishing which did not attract marks. |
| Question 1(g) (ii) | The expected response was 'odd-leg callipers' which is included in the course specification. |
| Question 3(a) | This question asked for the 'key stages of morphological analysis' which was also sampled in the specimen question paper. |
| Question 7(b) | This question asked for a description of 'how performance may have influenced the design of the child's camera'. Candidates tended to give basic fitness-for-purpose responses without referencing the likely performance requirements for the child. |
| Question 7(c) | This question asked for a description of 'technology push' and, while this is one of the more difficult concepts covered within the course specification, many candidates were clearly unfamiliar with the term. |
| Question 8(a) (i) | This question required candidates to name a thermoplastic and explain its suitability for the handle of the craft knife. Many candidates seemed to be unfamiliar with the range and properties of thermoplastics included in the course specification. |
| Question 8(a) (ii) | This question required candidates to name a thermoplastic and explain its suitability for the packaging of the craft knife. As in part (i), many candidates seemed to be unfamiliar with the range and properties of thermoplastics included in the course specification. |

Component 2: assignment — design

Evidence presented from many candidates was not at an appropriate level for National 5. Candidates produced good work in areas but had difficulty accessing marks in some areas of the assignment:

- ◆ Generating ideas: Although all candidates were able to produce ideas, many lacked range, diversity and/or creativity to show a high level of skill in this area. Often ideas were drawings of structures with no clarity on how it worked as the product.
- ◆ Exploration: Exploration was limited for many. There was limited use of the specification to evolve the solution and explore alternatives.
- ◆ Refinement: Many candidates did not record any refinement of manufacturing during the design stages. Refinement was also limited where candidates had not used the specification or engaged in any exploration.
- ◆ Using models: Although there was an improvement in the frequency of models being used, for many the use of models to generate, test, explore and refine ideas was generally limited and often served limited or no purpose. Few candidates used models to generate ideas. Models in development often served no purpose as they added no more information than was already in the sketches. Some candidates had not recorded the information they had gained from using models during development which limited the marks they could access.
- ◆ Application of knowledge: Candidates had limited opportunity to apply knowledge due to lack of meaningful exploration. Few candidates made use of the information in the brief and specification to apply knowledge and make decisions.

Component 3: assignment — practical

A significant number of candidates carried out very superficial evaluation.

Section 3: advice for the preparation of future candidates

Component 1: question paper

Centres should ensure they are familiar with the relevant marking instructions, which are published annually on SQA's website.

It would be considered good practice to ensure candidates respond in sentence format rather than single-word responses. Single-word answers can attract marks where the command word is 'name' or 'state', but if 'describe' and 'explain' are used as the command word, some degree of description or explanation is expected.

Low-level unqualified responses such as 'quick', 'easy', and 'cheap', are not awarded marks; this is to ensure candidates who showed deeper understanding of the topics, and are able to qualify their responses, are differentiated from those candidates who simply stated the low-level unqualified response.

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

The course specification contains a 'Skills, knowledge and understanding for the course assessment' section. This section contains all the available areas of sampling for production of the question paper. It would be anticipated that centres use some time prior to the examination to prepare candidates to respond to these areas of questioning.

The course specification includes an appendix containing course support notes. This appendix contains suggested activities and approaches to develop knowledge and understanding which would benefit candidates in their preparation for the final examination.

Component 2: assignment — design

Evidence from many of the candidates presented was not at an appropriate level for National 5. In some cases, this was true for the entire cohort presented by the centre. For future presentations centres should ensure that candidates are presented at the appropriate level.

Whilst it was pleasing that candidates had made full use of the pages available to them, there was limited evidence that centres had made use of the SQA Understanding Standards materials or that candidates had been given or used the 'Instruction for candidates' section of the coursework assessment task.

For future presentations, centres are advised to ensure all candidates have access to the 'Instruction for candidates' section as it outlines what candidates should do during different sections of the assignment. It is considered good practice to encourage candidates to refer to this section when working through their assignment. Centres should also familiarise themselves and their candidates with the SQA Understanding Standards materials. The

candidate evidence and the commentaries can be discussed with candidates to develop an understanding of the level and skills being assessed.

Centres should ensure candidates have developed appropriate skills in the areas being assessed. Centres should take note of the following when preparing their candidates for the assignment:

- ◆ Analysing the brief: On occasions all candidates from a centre had similar research in terms of identical order, method and information gathered. This approach tended to limit the candidates as research was invalid or superficial as it couldn't be used to generate information for the specification. Candidates must be able to carry out independent research that will allow detailed specification points to be extracted. Mind maps may help them think about what to research but they are not research and do not attract marks. Images of existing solutions or environments simply collated or used for personal opinion will not attract marks. Candidates must also consider use of questions in questionnaires and ensure they are meaningful and relevant for their chosen brief.
- ◆ When completing the specification, candidates must ensure they include the key starting points given in the brief as well as the facts from their research.
- ◆ Generating ideas: Candidates must be familiar with how to use a variety of idea generation techniques effectively. This will allow them to select and use an appropriate technique to quickly generate the wide range of creative ideas required. Producing only 4–5 ideas limits the candidate's ability to demonstrate a high level of skill in this area. Modelling ideas can help candidates who struggle with graphic skills produce more creative ideas.
- ◆ Exploring: Candidates must have the skill to explore alternative aspects of their proposal. Centres should encourage candidates to make use of their specification to do this, particularly the restraints such as sizes, aesthetics and functional requirements. When designing, candidates should be aware they must manufacture their solution during the assignment — practical stage, therefore candidates should be familiar with exploring aspects that will allow them to demonstrate a high level of skill in manufacturing.
- ◆ Refinement: Candidates must record any refinement taking place. Encouraging use of modelling to make decisions may help candidates in this area. Candidates should record all decisions for the design and manufacture of their solution (including dimensioned sketches, models or drawings) before completing the planning pro forma.
- ◆ Application of knowledge: Candidates must make use of their specification to apply knowledge when exploring and refining ideas, particularly making use of restraints such as sizes, aesthetics, functional and manufacturing requirements.
- ◆ Using models: Candidates should be familiar with using models to generate ideas, explore, test and refine aspects of a design. It is good practice to provide opportunities for candidates to use modelling for different purposes, so they develop confidence and the ability to decide when a model is required. This could be done using a few short modelling tasks. During the course teachers should encourage candidates to use models when they have difficulty sketching an idea or where they can learn to make more meaningful decisions by using a physical or CAD model. Candidates must be aware that marks are not awarded for simply making a model. Models must communicate something that is not in the sketches and annotation must explain what information has been gained from the model if it has been used to explore, test or refine.

- ◆ Planning for manufacture: This section was generally done well. Candidates produced good detail in drawings and the sequence of operations, however it was often unclear on the pro forma how the parts would be assembled.

Component 3: assignment — practical

This is a linked component and candidates must manufacture the proposal they develop in Component 2: assignment — design. Candidates need to be aware that their proposal will have to allow them to demonstrate all of the practical skills being assessed. A very simple proposal may have to be altered to allow them to do this — teachers and lecturers should advise candidates on the suitability of their proposal for generating practical evidence.

Candidates should be aware that the evaluation should be based on more than personal opinion. Centres should make use of the Understanding Standards materials on SQA's website.

Grade boundary and statistical information:

Statistical information: update on courses

Number of resulted entries in 2017	4980
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Number of resulted entries in 2018	4599
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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
Maximum mark				
A	12.3%	12.3%	565	118
B	18.3%	30.6%	842	101
C	26.0%	56.6%	1196	84
D	24.2%	80.8%	1113	67
No award	19.2%	-	883	-

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 which allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and 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 Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

- ◆ The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.
- ◆ The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.
- ◆ Where standards are comparable to previous years, similar grade boundaries are maintained.

Grade boundaries from exam 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 exams set by centres. If SQA alters a boundary, this does not mean that centres should necessarily alter their boundary in the corresponding practice exam paper.