



Advanced Higher
Coursework
Assessment Task



Advanced Higher Design and Manufacture

Assignment

Assessment task

This document provides information for teachers and lecturers about the coursework component of this course in terms of the skills, knowledge and understanding that are assessed. It **must** be read in conjunction with the course specification.

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Introduction

This document contains marking instructions, instructions for teachers and lecturers and instructions for candidates for the Advanced Higher Design and Manufacture assignment. You must read it in conjunction with the course specification.

This assignment has 120 marks out of a total of 200 marks available for the course assessment.

This is one of two course assessment components. The other component is a question paper.

Instructions for teachers and lecturers

Setting, conducting and marking the assignment

The assignment is:

- ◆ set by centres within SQA guidelines
- ◆ conducted under some supervision and control
- ◆ submitted to SQA for external marking

The assignment must be in response to a design opportunity that candidates identify independently, or through discussion with teachers and lecturers.

SQA quality assures all marking.

Before candidates undertake the assignment, teachers and lecturers should ensure that candidates have the necessary design skills and are aware of the requirements of the assessment. Centres should give candidates the 'Instructions for candidates' at the end of this document.

Candidates are assessed on:

Skill	Marks
◆ defining a design opportunity	12
◆ generating initial ideas	6
◆ exploring ideas	16
◆ refining ideas	12
◆ applying graphic techniques	12
◆ applying modelling techniques	12
◆ applying knowledge and understanding of design	14
◆ applying knowledge and understanding of materials, manufacturing and assembly methods	14
◆ producing a plan for commercial manufacture	10
◆ manufacturing a presentation model	12

Assessment conditions

Time

Candidates generate evidence of their design skills by responding to a suitable design opportunity. They produce evidence for the assignment over an extended period of time. This allows them to develop and refine their work before presenting it for assessment.

There must be no interruption for learning and teaching once the assignment has started. Once candidates begin their assignment, they must continue in each subsequent class period until they complete it.

Supervision, control and authentication

The assignment is produced under some supervision and control. This means that:

- ◆ candidates do not need to be directly supervised at all times
- ◆ the use of resources, including the internet, is not tightly prescribed
- ◆ the work an individual candidate submits for assessment is their own
- ◆ teachers and lecturers can provide reasonable assistance

Teachers and lecturers must put in place measures to ensure that the work an individual candidate submits for assessment is their own.

Teachers and lecturers must also retain the candidate's work between assessment sessions.

Resources

There are no restrictions on the resources that candidates may access while producing their assignment.

Reasonable assistance

Candidates must carry out the assessment independently. However, they can receive reasonable assistance before the formal assessment process takes place. The term 'reasonable assistance' is used to balance the need for support with the need to avoid giving too much help. If candidates need more than what is thought to be 'reasonable assistance', they may not be ready for assessment, or they may have been entered for the wrong level of qualification.

If a candidate working on their assignment is faced with more than one possible solution to a problem, teachers and lecturers can discuss the pros and cons of different options with them. The candidate can then decide on a solution based on the discussion.

Once candidates submit their completed assignment for assessment, it must not be changed by candidates or by teachers or lecturers.

Evidence to be gathered

Candidates must:

- ◆ produce a design folio in response to a suitably challenging design opportunity
- ◆ demonstrate the skills specified in the 'Skills, knowledge and understanding for the course assessment' table

Forms of evidence are likely to include, but are not restricted to: notes and annotations, graphics and photographs, physical and CAD models, and justification and evaluations.

Volume

Candidates must present their work on a maximum of 20 single-sided A3-sized sheets, or equivalent. This includes the photographic evidence required for 'manufacturing a presentation model'.

Marking instructions

The following marking instructions are for the Advanced Higher Design and Manufacture assignment. In line with SQA's normal practice, they are addressed to the marker. They will also be helpful for those preparing candidates for course assessment.

Candidates' evidence is submitted to SQA for external marking.

General marking principles

Always apply these general principles. Use them in conjunction with the detailed marking instructions, which identify the key features required in candidates' responses.

- a Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.
- 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 must seek guidance from your team leader.
- c When marking the assignment, you must refer to specific descriptions of competence for different mark ranges and allocate marks for each section using a 'best fit' approach.
- d The statements within the bands give an indication of what may appear in the evidence. Candidates do not need to meet every statement to achieve marks within a band.
- e Do not award marks where candidates' work does not meet the lowest range statement, or where they do not provide any evidence.

Detailed marking instructions

Skill	Max mark	Make your marking judgements based on the candidate's ability to define a design opportunity.			
		1-3 marks	4-6 marks	7-9 marks	10-12 marks
Defining a design opportunity	12	<ul style="list-style-type: none"> ◆ limited identification of issues ◆ limited research ◆ limited specification 	<ul style="list-style-type: none"> ◆ partially effective identification of issues ◆ partially effective research ◆ partially effective specification 	<ul style="list-style-type: none"> ◆ effective identification of issues ◆ effective research ◆ effective specification 	<ul style="list-style-type: none"> ◆ highly effective identification of issues ◆ highly effective research ◆ highly effective specification
Further information for assessing 'defining a design opportunity'					
<ul style="list-style-type: none"> ◆ Research should generate information that clarifies the design opportunity and/or identifies the requirements of the solution. ◆ Candidates can demonstrate skills in identifying issues when drawing up a brief and/or a specification. ◆ Candidates can demonstrate research skills: <ul style="list-style-type: none"> — when drawing up a brief, and/or — when generating information for the specification ◆ Research techniques must be appropriate to the information being gathered. ◆ Valid research will lead to a detailed specification and is likely to include information gained from primary research. 					

Skill	Max mark	Make your marking judgements based on the candidate's ability to generate initial ideas that address the specification		
		1-2 marks	3-4 marks	5-6 marks
Generating initial ideas	6	<ul style="list-style-type: none"> ◆ ideas show limited diversity ◆ ideas show limited creativity ◆ few ideas address the design opportunity ◆ ideas have limited detail 	<ul style="list-style-type: none"> ◆ ideas show some diversity ◆ ideas show some creativity ◆ some ideas address the design opportunity ◆ ideas have adequate detail 	<ul style="list-style-type: none"> ◆ ideas show diversity ◆ ideas show creativity ◆ ideas address the design opportunity ◆ ideas have effective detail
Further information for assessing 'generating initial ideas'				
<ul style="list-style-type: none"> ◆ Award marks in this section for initial ideas. Award marks for additional ideas under 'exploration'. ◆ To demonstrate the skills at the level of the top marks band, candidates are likely to generate a wide range of ideas. ◆ Award marks for candidates' creativity and their ability to generate diverse ideas. Do not award marks for iterations of the same idea. ◆ To achieve marks, ideas must address the design opportunity. For example, do not award marks for random shapes or forms. ◆ Do not award marks above the bottom band for copies or slight alterations of existing ideas. ◆ Effective detail will communicate how the idea addresses the design opportunity. ◆ Candidates can communicate detail through graphics, models and/or annotations. 				

Skill	Max Mark	Make your marking judgements based on the candidate's ability to explore ideas towards a design proposal.			
		1-4 marks	5-8 marks	9-12 marks	13-16 marks
Exploring ideas	16	<ul style="list-style-type: none"> ◆ limited exploration ◆ limited consideration of alternatives ◆ few requirements of the proposal have been considered 	<ul style="list-style-type: none"> ◆ partially effective exploration ◆ some consideration of alternatives ◆ some requirements of the proposal have been considered 	<ul style="list-style-type: none"> ◆ effective exploration ◆ good consideration of alternatives ◆ most requirements of the proposal have been considered 	<ul style="list-style-type: none"> ◆ highly effective exploration ◆ clear consideration of alternatives ◆ the requirements of the proposal have been considered
Further information for assessing 'exploring ideas'					
<ul style="list-style-type: none"> ◆ Meaningful exploration results in improvements to initial ideas. The requirements of the brief and/or specification should drive the exploration. Evidence of meaningful exploration is likely to look divergent and be fuelled by the candidate's creativity, problem-solving ability, and knowledge and understanding. ◆ Candidates can demonstrate exploration: <ul style="list-style-type: none"> — throughout the design folio, evidence is likely to be in the form of graphics, photographs of models, and annotations — through considering the requirements of the proposal — through considering alternatives to the key aspects, such as functional requirements, safety, ergonomics, assembly and aesthetics, to evolve the proposal ◆ Exploration must be meaningful. Do not award marks for simple changes, such as rounding corners. 					

Skill	Max mark	Make your marking judgements based on the candidate's ability to refine ideas towards a design proposal.			
		1-3 marks	4-6 marks	7-9 marks	10-12 marks
Refining ideas	12	<ul style="list-style-type: none"> ◆ limited refinement of ideas ◆ limited range of aspects of the proposal has been refined ◆ limited detail to inform plan for manufacture 	<ul style="list-style-type: none"> ◆ some effective refinement of ideas ◆ partially effective range of aspects of the proposal has been refined ◆ partially effective detail to inform plan for manufacture 	<ul style="list-style-type: none"> ◆ effective refinement of ideas ◆ effective range of aspects of the proposal has been refined ◆ effective detail to inform plan for manufacture 	<ul style="list-style-type: none"> ◆ highly effective refinement of ideas ◆ highly effective range of aspects of the proposal has been refined ◆ highly effective detail to inform plan for manufacture
Further information for assessing 'refining ideas'					
<ul style="list-style-type: none"> ◆ Thorough refinement will result in a detailed proposal. Evidence of refinement is likely to look convergent and be fuelled by the candidate's ability to test, evaluate and apply knowledge and understanding. ◆ Refinement should lead to a level of detail that allows the candidate to produce a plan for commercial manufacture, including key details such as materials, detailed dimensions, assembly methods and manufacturing methods. ◆ Do not award marks above the bottom band for dimensioned drawing on its own. 					

Skill	Max Mark	Make your marking judgements based on the candidate's ability to use graphic techniques to communicate the development and detail of the proposal.			
		1-3 marks	4-6 marks	7-9 marks	10-12 marks
Applying graphic techniques	12	<ul style="list-style-type: none"> ◆ limited communication through graphics ◆ limited detail is communicated through graphics 	<ul style="list-style-type: none"> ◆ partially effective communication through graphics ◆ partially effective detail is communicated through graphics 	<ul style="list-style-type: none"> ◆ effective communication through graphics ◆ effective detail is communicated through graphics 	<ul style="list-style-type: none"> ◆ highly effective communication through graphics ◆ highly effective detail is communicated through graphics
Further information for assessing 'applying graphic techniques'					
<ul style="list-style-type: none"> ◆ Evidence for this skill may appear throughout the design folio. ◆ Candidates must apply recognised graphic types that are appropriate to their purpose. ◆ Award marks for appropriately applying graphics, not just the quality of the graphics. ◆ Candidates should apply graphics to communicate detail, where appropriate. ◆ To achieve marks in the top band, it is likely that the candidate has applied a range of graphic types that communicate details such as sizes, features of components, and assembly. 					

Skill	Max mark	Make your marking judgements based on the candidate's ability to apply a range of modelling techniques to inform and communicate design decisions.			
		1-3 marks	4-6 marks	7-9 marks	10-12 marks
Applying modelling techniques	12	<ul style="list-style-type: none"> ◆ limited use of modelling to inform design decisions ◆ limited use of modelling to communicate design decisions 	<ul style="list-style-type: none"> ◆ partially effective use of modelling to inform design decisions ◆ partially effective use of modelling to communicate design decisions 	<ul style="list-style-type: none"> ◆ effective use of modelling to inform design decisions ◆ effective use of modelling to communicate design decisions 	<ul style="list-style-type: none"> ◆ highly effective use of modelling to inform design decisions ◆ highly effective use of modelling to communicate design decisions
Further information for assessing 'applying modelling techniques'					
<ul style="list-style-type: none"> ◆ Candidates can carry out modelling at any stage of the design process. ◆ To achieve marks, candidates must indicate what they have learned from the models and what decisions they have reached. ◆ To achieve marks in the top band, it is likely that the candidate has applied a range of modelling techniques. ◆ Modelling can be in the form of computer-generated and/or physical models. 					

Skill	Max mark	Make your marking judgements based on the candidate's ability to apply knowledge and understanding of design.			
		1-3 marks	4-7 marks	8-11 marks	12-14 marks
Applying knowledge and understanding (KU) of design	14	<ul style="list-style-type: none"> ◆ limited use of KU of design to inform decisions ◆ limited KU of design 	<ul style="list-style-type: none"> ◆ partially effective use of KU of design to inform decisions ◆ some KU of design 	<ul style="list-style-type: none"> ◆ effective use of KU of design to inform decisions ◆ good KU of design 	<ul style="list-style-type: none"> ◆ highly effective use of KU of design to inform decisions ◆ strong KU of design
Further information for assessing 'applying knowledge and understanding of design'					
<ul style="list-style-type: none"> ◆ Evidence for this skill may appear throughout the design folio. ◆ Evidence can be in the form of candidate annotations, comments, graphics and evaluations. ◆ Candidates should apply their knowledge and understanding of design to develop the proposal. ◆ To achieve marks in the top band, candidates must demonstrate application of a range of knowledge and understanding of design in the development of their design proposal. ◆ Do not award marks for generic statements about design. ◆ Do not award marks for lists of archived facts about design. ◆ To achieve marks in the top band, candidates must apply design knowledge related to the key points in the specification. 					

Skill	Max Mark	Make your marking judgements based on the candidate's ability to apply knowledge and understanding (KU) of materials, manufacturing and assembly methods.			
		1-3 marks	4-7 marks	8-11 marks	12-14 marks
Applying knowledge and understanding (KU) of materials, manufacturing and assembly methods	14	<ul style="list-style-type: none"> ◆ limited KU of materials, manufacturing and assembly ◆ limited use of KU of materials, manufacturing and assembly to evaluate and inform decisions 	<ul style="list-style-type: none"> ◆ some KU of materials, manufacturing and assembly ◆ partially effective use of KU of materials, manufacturing and assembly to inform decisions 	<ul style="list-style-type: none"> ◆ good KU of materials, manufacturing and assembly ◆ effective use of KU of materials, manufacturing and assembly to inform decisions 	<ul style="list-style-type: none"> ◆ strong KU of materials, manufacturing and assembly ◆ highly effective use of KU of materials, manufacturing and assembly to inform decisions
Further information for assessing 'applying knowledge and understanding of materials, manufacturing and assembly methods'					
<ul style="list-style-type: none"> ◆ Evidence for this skill may appear throughout the design folio. ◆ Evidence can be in the form of candidate annotations, comments, justification and evaluations. ◆ Candidates should apply their knowledge and understanding of materials, manufacturing and assembly processes to develop the proposal. ◆ To achieve marks in the top band, candidates must demonstrate application of detailed and appropriate knowledge and understanding of materials, manufacturing and assembly processes in the development of their design proposal. ◆ Do not award marks for generic statements about materials and processes. ◆ Do not award marks for lists of archived facts about materials and processes. 					

Skill	Max mark	Make your marking judgements based on the candidate's ability to produce a plan for commercial manufacture.			
		1-2 marks	3-5 marks	6-8 marks	9-10 marks
Producing a plan for commercial manufacture	10	<ul style="list-style-type: none"> ◆ limited detail of component parts ◆ limited detail of assembly 	<ul style="list-style-type: none"> ◆ adequate detail of component parts ◆ adequate detail of assembly 	<ul style="list-style-type: none"> ◆ effective detail of component parts ◆ effective detail of assembly 	<ul style="list-style-type: none"> ◆ highly effective detail of component parts ◆ highly effective detail of assembly
Further information for assessing 'producing a plan for commercial manufacture'					
<ul style="list-style-type: none"> ◆ Details of component parts may include materials, processes and manufacturing features. ◆ Details of assembly may include methods and order or assembly. ◆ Evidence may be in the form of graphics, tables and annotations. 					

Skill	Max mark	Make your marking judgements based on the candidate's ability to manufacture a presentation model.			
		1-3 marks	4-6 marks	7-9 marks	10-12 marks
Manufacturing a presentation model	12	<ul style="list-style-type: none"> ◆ limited skills in manufacturing a presentation model ◆ limited communication of key features of the proposal 	<ul style="list-style-type: none"> ◆ partially effective skills in manufacturing a presentation model ◆ partially effective communication of key features of the proposal 	<ul style="list-style-type: none"> ◆ effective skills in manufacturing a presentation model ◆ effective communication of key features of the proposal 	<ul style="list-style-type: none"> ◆ highly effective skills in manufacturing a presentation model ◆ highly effective communication of key features of the proposal
Further information for assessing 'manufacturing a presentation model'					
<ul style="list-style-type: none"> ◆ Candidates must produce a physical model as the skills being assessed are in the manufacture of a presentation model. ◆ The model, or component parts of the model, may be manufactured manually or by use of CAM, or a combination of both. ◆ Key features of the proposal will depend on the product designed but may include aesthetic, ergonomic, functional, safety or assembly features. ◆ Evidence is in the form of photograph(s) of the model. Make your assessment judgements only on evidence that is clearly visible in the photographs. ◆ Do not award marks for CAD models in this section. ◆ Do not award marks for models produced during the development of the proposal. 					

Instructions for candidates

This assessment applies to the assignment for Advanced Higher Design and Manufacture.

This assignment has 120 marks out of a total of 200 marks available for the course assessment.

It assesses the following skills:

Skill	Marks
◆ defining a design opportunity	12
◆ generating initial ideas	6
◆ exploring ideas	16
◆ refining ideas	12
◆ applying graphic techniques	12
◆ applying modelling techniques	12
◆ applying knowledge and understanding of design	14
◆ applying knowledge and understanding of materials, manufacturing and assembly methods	14
◆ producing a plan for commercial manufacture	10
◆ manufacturing a presentation model	12

Your teacher or lecturer will let you know if there are any specific conditions for doing this assessment.

In this assessment, you have to identify a design opportunity and develop a proposal for it. Your evidence must be presented in the form of a design folio.

Discuss ways of identifying suitable design opportunities with your teacher or lecturer. For example, you could:

- ◆ identify an issue with a product or a situation in your day-to-day activities or through your study of Advanced Higher Design and Manufacture
- ◆ look for an opportunity by carrying out visits to selected environments and conducting observations and/or interviews

Further information on identifying suitable design opportunities is available in SQA course support notes available from your teacher or lecturer.

Things to remember:

- ◆ Your design folio must have a maximum of 20 A3 sheets (or equivalent). This includes the photographic evidence required for 'manufacturing a presentation model'.
- ◆ Each A3 sheet must be labelled with your name, Scottish Candidate Number and page number, for example page 1 of 20.

- ◆ All sheets must be single-sided.
- ◆ The work submitted must be your own.
- ◆ There are no restrictions on the resources you can access while producing your assignment. You can use books, notes or the internet if you require information.
- ◆ You must provide suitable evidence for the skills being assessed. The following table provides guidance to help you generate suitable evidence.

Skill	What you have to do	Notes
Defining a design opportunity (12 marks)	Define a design opportunity	You should: <ul style="list-style-type: none"> ◆ identify a suitably challenging design opportunity that allows you to demonstrate the skills being assessed in the assignment ◆ check with your teacher or lecturer that the opportunity you have identified is suitable ◆ carry out suitable research that leads to a clear definition of the problem ◆ carry out research to draw up a brief and/or a specification
Generating initial ideas (6 marks)	Generate a range of creative and diverse ideas	<ul style="list-style-type: none"> ◆ Your ideas should: <ul style="list-style-type: none"> — show creativity — show diversity — address the brief and/or specification — have enough detail to communicate that they address the brief and/or specification ◆ You may use idea-generation techniques. ◆ You should aim to generate a large number of ideas quickly – your sketches or models may be rough at this stage. ◆ Your evidence for this skill may be in the form of annotated sketches, drawings, or photographs of models.
Exploring ideas (16 marks)	Explore your ideas	<ul style="list-style-type: none"> ◆ Use your brief and/or specification to help you explore. Your exploration should: <ul style="list-style-type: none"> — consider a wide range of alternatives — significantly advance your initial idea (not just make simple superficial changes) ◆ You may display your exploration through graphics, models and annotations.

Skill	What you have to do	Notes
Refining ideas (12 marks)	Refine your ideas	You should: <ul style="list-style-type: none"> ◆ refine a range of features of the proposal, such as function, sizes, materials, aesthetics and assembly ◆ aim to produce a detailed proposal suitable for manufacture
Applying graphic techniques (12 marks)	Use graphics to communicate your proposal and its development	Your evidence for this skill may be in the form of sketches, drawings and computer graphics throughout your design folio. <ul style="list-style-type: none"> ◆ You should use a range of graphic types that suit their purpose. ◆ You should use graphics to communicate detail where appropriate. ◆ You may use manual and computer graphics as appropriate.
Applying modelling techniques (12 marks)	Use modelling techniques to inform and communicate your design decisions	<ul style="list-style-type: none"> ◆ Use a range of modelling techniques as appropriate to help you inform and communicate your design decisions. You can carry out modelling at any stage of the design process. ◆ Modelling can be in the form of computer-generated models or physical models. ◆ You will not receive marks for simply making models. ◆ You must indicate what you have learned from the model and what decisions you have reached.
Applying knowledge and understanding of design (14 marks)	Apply your knowledge and understanding of design to develop your proposal	Use your knowledge to help you develop your proposal. You will not receive marks for simply listing facts. <p>You should:</p> <ul style="list-style-type: none"> ◆ apply the knowledge you gained in the Advanced Higher course ◆ display your knowledge and understanding through your sketches, drawings and models, and clarify them through your written comments ◆ demonstrate that you have made valid decisions based on your knowledge

Skill	What you have to do	Notes
Applying knowledge and understanding of materials, manufacturing and assembly methods (14 marks)	Apply your knowledge and understanding of materials, manufacturing and assembly methods to develop your proposal	<p>Use your knowledge and understanding to help you develop your proposal. You will not receive marks for simply listing facts.</p> <p>You should:</p> <ul style="list-style-type: none"> ◆ apply the knowledge you gained in the Advanced Higher course ◆ display your knowledge and understanding through your sketches, drawings and models, and clarify them through your written comments ◆ demonstrate that you have made valid decisions based on your knowledge
Producing a plan for commercial manufacture (10 marks)	Produce a plan which details the commercial manufacture for your proposal	<p>Your evidence for this skill may be in the form of sketches, drawings and text.</p> <p>Your plan should include:</p> <ul style="list-style-type: none"> ◆ details of component parts – this may be in the form of dimensioned drawings, sketches or photographs of models ◆ details of assembly ◆ a completed product part table
Manufacturing a presentation model (12 marks)	Manufacture a presentation model	<ul style="list-style-type: none"> ◆ You must demonstrate skills in manufacturing a presentation model; therefore, you must produce a physical model. ◆ You can manufacture your model or component parts of your model manually, or use CAM, or a combination of both. ◆ Your evidence must be in the form of photograph(s) of the model. Make sure that the evidence is clearly visible in the photograph(s). ◆ You do not achieve marks for CAD models in this section. ◆ You do not achieve marks for models produced during the development of the proposal in this section.

Administrative information

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History of changes

Version	Description of change	Date
1.0 amended	Amended to reflect the removal of 'manufacturing a presentation model', in line with published modifications summary for session 2020-21.	October 2020
2.0	Reinstated 'manufacturing a presentation model' and returned to 120 marks for assignment.	May 2023

Note: you are advised to check SQA's website to ensure you are using the most up-to-date version of this document.

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