

Route map through learning, teaching and assessment

Course: Design and Manufacture

Level: Higher

This route map is intended to assist staff in planning and delivering the overall vision for Curriculum for Excellence. It has been developed to signpost the relevant support materials available to assist staff in the planning of learning, teaching and assessment of Higher Design and Manufacture.

The vision for the new qualifications is to create assessment opportunities that follow and support learning and teaching. This follows the principles laid out in *Building the Curriculum 5* and makes assessment a natural part of learning and teaching.

Education Scotland has published support materials to help staff develop programmes of learning drawn from three sources: course materials commissioned by Education Scotland, other support materials produced by staff seconded to Education Scotland and course materials provided by staff through their education authorities. Further materials will be added as they become available.

These support materials, which are neither prescriptive nor exhaustive, provide suggestions on approaches to learning and teaching that will promote development of the necessary knowledge, understanding and skills for Higher Design and Manufacture. Staff are encouraged to draw on these materials, and existing materials, to develop their own programmes of learning which are appropriate to the needs of learners within their own context.

The link to Education Scotland's support materials can be found below together with a number of other subject-specific links staff may find helpful as they develop **programmes of learning** for Higher Design and Manufacture. These links are followed by a sequential list of the key guidelines, advice and support for the Higher Design and Manufacture **qualification**. This information is intended to support staff in deciding the most appropriate ways to generate evidence and assess learners.

Useful links for learning and teaching Higher Design and Manufacture

Education Scotland NQ course materials (Glow login and password required)

A wide range of learning and teaching resources to help staff develop programmes of learning.

<http://www.educationscotland.gov.uk/nqcoursematerials/subjects/designandmanufacture/index.asp>

SQA course and unit support notes providing advice and guidance on learning and teaching

http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_Higher_Technologies_DesignandManufacture.pdf



Key Curriculum for Excellence support

A quick guide to finding vital information about Curriculum for Excellence under the following headings:

- the latest guidance, updates and plans for embedding Curriculum for Excellence
- information on assessment
- information on the new qualifications.

<http://www.educationscotland.gov.uk/keycfesupport/index.asp>

National Assessment Resource (login and password required)

Materials that inform planning for learning, teaching, moderation and assessment.

<https://www.narscotland.org.uk/>

Higher Design and Manufacture course content

Higher Design and Manufacture consists of two units and a coursework assessment. The two units are:

- Design and Manufacture: Design
- Design and Manufacture: Materials and Manufacturing.

Design and Manufacture: Design

http://www.sqa.org.uk/files_ccc/CfE_Unit_H_DesignandManufacture_Design.pdf

There is a full package of unit assessment support available on the SQA Secure website for this mandatory unit. The package includes unit assessments for both combined approaches, and also unit-by-unit approaches.

Design and Manufacture: Materials and Manufacturing

http://www.sqa.org.uk/files_ccc/CfE_Unit_H_DesignandManufacture_MaterialandManufacturing.pdf

There is a full package of unit assessment support available on the SQA Secure website for this mandatory unit. The package includes unit assessments for both combined approaches, and also unit-by-unit approaches.

Course Assessment

http://www.sqa.org.uk/files_ccc/CfEAssessmentOverviewHigherDesignandMan.pdf

Unit and course assessment

Units are mandatory when taken as part of the full Higher Design and Manufacture course but they can be standalone also. Unit support notes follow on from the course support notes.

http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_Higher_Technologies_DesignandManufacture.pdf

All units are internally assessed against the requirements shown in the unit specification. They can be assessed on a unit-by-unit basis or by combined assessment. They will be assessed on a pass/fail basis within centres.

Requirements for the coursework assessment

The assessment of the units in this course will be as follows.

**Design and Manufacture: Design**

In this unit evidence will be provided by the development, production, evaluation and justification of design proposals, including a specification, in response to a brief which covers a range of key design factors. Knowledge and understanding will also be assessed.

Design and Manufacture: Materials and Manufacturing

In this unit evidence will be provided by the production and evaluation of a prototype. This will be done in response to a brief that covers a range of key requirements. Knowledge and understanding will also be assessed.

External assessment

The external course assessment comprises a question paper and an assignment, worth a total of 140 marks.

Component 1 – Assignment (70 marks, 50% of the overall marks for the course assessment)

The purpose of the assignment is to assess the learner's ability to apply skills, knowledge and understanding to solve a design task in a given context. It assesses the learner's ability to communicate, generate and refine ideas, and apply modelling and/or prototyping skills in presenting a potential solution.

The assignment will give learners an opportunity to:

- generate, explore and refine a range of creative ideas in response to brief or situation
- apply graphic and modelling techniques appropriate to stage and design activities that communicate necessary information and details
- demonstrate knowledge and understanding of materials and processes through application when resolving design tasks, providing solutions and justifying design decisions
- demonstrate knowledge and understanding of design issues through application when resolving design tasks, providing solutions and justifying design decisions.

Time will be required for:

- preparation for the assignment, which could include considering exemplar assignments and practising required skills
- carrying out the stages of the assignment, with staff guidance and support
- reviewing and evaluating the learner's progress and justifying design decisions.

The assignment should clearly demonstrate the application of knowledge and skills at an appropriate level from both the Design and the Materials and Manufacturing units (as defined in the Further mandatory information on course coverage section of the course assessment specification).

Marks will be awarded for:

- generating ideas
- exploring and refining ideas
- applying graphic techniques
- applying modelling techniques
- applying knowledge and understanding of materials and processes
- applying knowledge and understanding of design issues.

Evidence will be in the form of a design folio.

Component 2 – Question Paper

(70 marks, 50% of the overall marks for the course assessment)

The purpose of the question paper is to assess the learner's ability to retain and integrate knowledge and understanding from across the course.

The question paper will require the learner to demonstrate:

- a broad understanding of the impact of a range of design and manufacturing technologies on our environment and society
- the critical evaluation of a range of factors that influence the design and manufacture of products
- an understanding of a broad range of industrial and commercial manufacturing processes and the properties and uses of materials.

The question paper will have two sections:

Section 1 will have 25 marks. It will consist of a single question, based on a product type, and will require extended and reasoned responses. The question will follow a similar format each year and will test the learners' knowledge and understanding of core areas from across the course. The question will also require the learner to integrate this knowledge. This question will focus on the design factors and justification of the materials and manufacturing processes associated with a product, namely, materials, tools and processes. It will give learners an opportunity to demonstrate:

- knowledge and understanding of how products are influenced by materials and processes
- knowledge and understanding of the use of tools
- knowledge of how products are influenced by design factors.

Within each of these broad areas, questions will sample across the main topics, so that each question paper will have some marks related to each of the following sub-topics:

- design processes (including communication and modelling)
- design factors
- materials selection and use
- production planning and industrial processes.

Section 2 will have 45 marks. It will consist of five or six questions. The responses will require integration of knowledge and understanding from across the course. Questions will be based on products that are illustrated or products with which the learners are familiar. This section will give learners an opportunity to demonstrate the knowledge and understanding specified in the table provided in the further mandatory information on course coverage section of the course assessment specification.

Verification

The verification process is intended to be supportive and not onerous. Internal verification is the process of ensuring that standards are applied uniformly and consistently within a school in line with national standards. External verification is the process of ensuring that national standards are maintained consistently across all schools. Information on quality assurance can be found at <http://www.sqa.org.uk/sqa/58448.html>.

The following links will also support staff when preparing evidence for verification purposes, including prior verification, as well as internal and external verification:

http://www.sqa.org.uk/files_ccc/Prior%20Verification%20Centre%20Guidance%20FINAL.pdf

http://www.sqa.org.uk/sqa/files_ccc/InternalVerificationGuideforSQACentres.pdf

http://www.sqa.org.uk/sqa/files_ccc/Evidence_required_for_verificationevents.pdf
http://www.sqa.org.uk/sqa/files_ccc/SQA_Evidence_retention_requirements_A3_table.pdf

Key messages from verification will be put up on the SQA website.

Results services

http://www.sqa.org.uk/sqa/files_ccc/FA6669_SQA_Results_Services_A5_8pp_brochure_web.pdf
<http://www.sqa.org.uk/sqa/65427.html>

SQA offer two services to replace the appeals process:

- Exceptional Circumstances Consideration Service (details to be provided to SQA within ten days of the learner sitting the external assessment)
- Post-results Service – this consists of a clerical check and/or a marking review if the centre has concerns about the results of an individual or group.