SQA Advanced Unit Specification

General information for centres

Unit title: Computer Aided Architectural Design and Technology: Model Making (SCQF level 7)

Unit code: HR6W 47

Superclass: TD

Publication date: August 2017

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

This Unit is designed to enable learners to understand the process, planning and execution involved in the construction of a simple presentation architectural model. The Unit is designed to be an introduction to basic model-making principles and processes for architectural presentation purposes, and the knowledge and skills gained in this Unit will prepare learners for advanced architectural design-based Units.

Outcomes

On successful completion of the Unit the learner will be able to:

1 Appraise and demonstrate the use of equipment and materials for architectural modelling.
2 Prepare production data to an agreed specification.
3 Produce an architectural model to an agreed specification.

Credit points and level

1 SQA Advanced Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

Recommended entry to the Unit

Learners should have an understanding of design processes, and a working knowledge of architectural design/construction, in particular. This may be demonstrated by the possession of National or Higher Units, such as Graphic Communication, Art, Craft and Design, or

equivalent. It would be beneficial if learners had completed a suitable Architectural CAD Unit, such as HR6M 47 *Architectural CADT: Residential Design* at SCQF level 7, or equivalent type of Unit as this could provide the source material for model-making activity.

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes for this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**.

SQA Advanced Unit specification: statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Appraise and demonstrate the use of equipment and materials for architectural modelling.

Knowledge and/or skills

- hand tools
- construction materials
- working practices and operational procedures
- health and safety

Outcome 2

Prepare production data to an agreed specification.

Knowledge and/or skills

- primary data specifications
- methodology
- materials
- schedule of requirement
- production requirements

Outcome 3

Produce an architectural model to an agreed specification.

Knowledge and/or skills

- model brief
- model construction
- model assembly
- rendering and finishing techniques
- model detailing
- health and safety

Evidence Requirements for this Unit

Outcome 1

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

- appraise the types, function, operational procedures and selection criteria for modelling hand tools
- demonstrate the safe use of four selected modelling tools
- appraise the types, function, operational procedures and selection criteria for four construction materials
- describe three examples of safe working practices and two operational procedures within a modelling workshop or studio environment you might expect to have to adhere to in relation to materials and tool use to meet current Health and Safety requirements for this type of work

Evidence for this Outcome must consist of a series of answers to short, restricted response questioning about modelling tools and materials, Health and Safety workshop and studio protocols and a practical test of the safe usage of modelling tools and materials, evidence of which is to be recorded on a checklist. The practical assessment tasks must be supervised.

The Health and Safety elements and tool use procedures of the Outcome **must be satisfactorily completed** prior to learner engagement with the practical task in Outcomes 3.

Outcome 2

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can for a single residential dwelling house of moderate proportions:

- interpret primary data from an agreed specification
- prepare annotated drawings with production requirements, material construction and finishing details
- plan the production of the model in terms of time, material and cost
- produce recorded production data

The assessment tasks must be supervised.

The specification used to generate the design concept for the model-making assignments must have sufficient scope and primary data to allow the learner to generate the required evidence. Learners must generate scale drawings and model assignment appropriate to the specifications given and interrogate the design details for production requirements. The resulting data from this investigation must be produced as a Schedule of Requirement detailing scale output of model, construction material requirements, assembly process, time management and cost implications.

The production requirements should be generated in advance of the practical task, as an additional schedule or checklist to notarise and record the physical requirements for the execution of the practical task in relation to tools, material and other physical needs.

Learners whose assessment response does not meet the minimum evidence may be offered remediation and the opportunity for re-submission to reflect industry practice. For example drawing or modelling details requiring minor revision or modification may be remediated and re submitted rather than the whole of the assessment resubmitted.

Outcome 3

Learners will need to provide evidence to demonstrate their knowledge and/or skills by producing a completed architectural model in accordance with an agreed client specification for a single residential dwelling house of moderate proportions showing that they can:

- select and use hand tools and construction materials for the architectural model
- demonstrate effective diffusion of the abstract (brief, drawings) to the physical (model)
- produce the model demonstrating robustness of the assembly and clean construction techniques
- apply colour, tone and texture to the model to demonstrate effective indication of surface treatments to the model
- implement detailing to the model
- demonstrate consistent compliance with Health and Safety protocols in the execution of the assignment

The assessment tasks must be supervised.

The specification used to generate the design concept for the model-making assignments must have sufficient scope and primary data to allow the learner to generate all the required evidence.

SQA Advanced Unit support notes

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Unit support notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This Unit has been written in order to allow learners to develop knowledge, understanding and skills in the following areas:

1 Appraise and demonstrate the use of appropriate equipment and materials for architectural modelling.
2 Prepare production data to an agreed specification.
3 Produce an architectural model to an agreed specification.

The Unit is at SCQF level 7 and has been devised as an optional Unit within the SQA Advanced Certificate and SQA Advanced Diploma in Computer Aided Architectural Design and Technology Group Awards. However, this does not preclude the use of the Unit in other Group Awards.

Outcome 1

- hand tools:
  - cutting tools, knives, blades, scalpels, trimmers
  - measuring tools, rules, scale rules, dividers, triangles, squares
  - mark-up tools, pens, pencils, draughting instruments
  - design table, seating, cutting mats

- selection of construction materials:
  - mounting board
  - foam, cork, balsa
  - card and sheet materials
  - acetates, plastics
  - glues and adhesives
  - entourage objects (trees, landscaping, figures)
  - paints and varnishes

Outcome 2

Scale drawings could be generated from the source design specified. These scale drawings form the basis of the primary design data specification for the practical tasks. From these, learners should demonstrate clear and effective thinking in terms of Schedule of Requirement details such as: scale output of model, construction material requirements, assembly process, time management and cost implications.

The Schedule of Requirements should clearly indicate the major planning factors related to the practical task in terms of timing, sequence of operation, indicative costs, targets and deadlines and the nature and range of the end product.

Guidance on approaches to delivery of this Unit

In this Unit the learners should be encouraged to practice the use of hand tools so that they can use them proficiently and demonstrate clear and effective thinking in the safe working practices of a typical studio/workshop as they go about their practical tasks. Learners could work in groups to monitor the application of safe and consistent protocols in the selection, use, maintenance and care of tools, studio equipment and craft materials amongst the group. These protocols could be discussed and demonstrated in the first instance by the lecturer and subsequently it is the learner's responsibility to ensure they observe and adhere to these procedures upon which they will be assessed. Ongoing Health and Safety protocols could be monitored throughout delivery of the Unit, using checklists, equipment signing/authorisation sheets, or other established local procedures to satisfy this end.

Outcome 1

Discussion and demonstration of tools, equipment and safe studio practice should be the principal topics of initial learning experiences. Learners should be prepared for the completion of Outcome 1 as early as possible in order to maximise studio time for practical assignment and development of models.

Practical assessment tasks must be under supervised conditions.

Failure to complete Outcome 1 in a timely fashion could significantly reduce learner development time for the practical aspects of Outcomes 2 and 3.

Outcome 2

Material construction and finishes.

It is likely that there exists opportunities for integration with other Units in the programme, for example, the HR6M 47 *Architectural CADT: Residential Design* Unit. Alternatively, completed design details could be provided by the lecturer, or be generated from real or simulated clients out with the centre. In any scenario, the design details should be approved by the lecturer.

There could be initial opportunities in this Outcome for group-based *formative* assessment, with learners working in pairs.

Scale drawings could be generated from the source design specified. Ongoing discussion and tutorials could be used to give learners the opportunity to explore possibilities, verbally justify and explain the development of their methods.

A recording system for methods and findings could be provided by the centre to allow learners to notarise and schedule production plan requirements.

Outcome 3

Learners are required to complete and present the finished model by a given deadline. Key times for development of the model and working process could be negotiated with learners and a submission date set by the lecturer, allowing learners to develop time management skills within a target driven scenario.

The evidence could be presented to staff and peers at the conclusion of the studio experience and supported by interactive discussion, oral questioning and response, evaluation and reflection.

Learners whose assessment responses do not meet the minimum evidence may be offered remediation and the opportunity for re-submission to reflect industry practice. For example drawing or modelling details requiring minor revision or modification may be remediated and resubmitted rather than the whole of the assessment resubmitted.

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Outcomes 1 and 2 require evidence of practical competence and explanatory evidence, while Outcome 3 is a practical assignment. Outcomes 2 and 3 could be assessed individually, or if the same modelling details are developed, the modelling tasks for both these Outcomes could be assessed using one integrated assessment project.

All Outcomes should be conducted under controlled, supervised conditions.

Assessment guidelines

Outcome 1

The knowledge requirements for this Outcome could be open or closed-book. The safe operation of equipment and safe workplace practice underpins the practical assignment requirements for Outcome 3.

Outcome 2

The knowledge and/or skills acquired for this Outcome underpins the remaining practical assessment for Outcome 3. The agreed specification for the model-making task may be by learner selection, or at the discretion of the lecturer.

Outcome 3

The focus of the model-making assignment is on the practical production of a completed design. The source material for this Outcome could be provided from this or other Units. Surface treatments to the model could include walls, glass, stone, and roads. Detailing to be entourage details such as trees or figures.

Learners whose assessment response does not meet the minimum evidence may be offered remediation and the opportunity for resubmission to reflect industry practice. For example drawing or modelling details requiring minor revision or modification may be remediated and resubmitted rather than the whole of the assessment resubmitted.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at **www.sqa.org.uk/e-assessment**.

Opportunities for developing Core and other essential skills

Learners are working in a context which requires that they produce original design work in a practical context. This Unit allows the opportunity to build on the originality of design work, which may have already been established in this or other Units within the Group Award. Opportunities for developing the Core Skill of *Problem Solving* at SCQF level 6 are as follows.

As learners work towards practical solutions in the delivery of the summative assessment to the established brief, they will naturally develop an advanced level of *Problem Solving* skills. They need to analyse a range of theoretical and practical problems and issues, taking account of appropriate scale, tools, materials and structures, as well as budget and timescales. Analysing and assessing the relative significance of each before identifying and justifying an appropriate strategic approach to visual concept development will provide opportunities to develop creative critical thinking and general problem-solving skills to an advanced level. Appraisal and safe use of materials and tools is integral to achievement. Evaluating the potential and actual impact of their solutions will be a critical aspect of underpinning knowledge and understanding. Learners could be supported in identifying appropriate criteria to measure achievement and progress in product and process evaluation in Outcome 3.

Skills in developing an effective search strategy for accessing and evaluating paper-based and electronic sources of design data should be developed. This is principally concerned with the appropriate electronic interrogation of the original, established design specifications. The accessing, transfer and modification of retrieved information is an essential skill and support should be made available through a VLE, or similar platform. The emphasis of formative work, focusing on *Numeracy* as a tool to be used and applied efficiently is inherent in the transfer of proportions, scale and dimensions from the abstract to the physical. This provides for the development of the Core Skills *Numeracy* and *ICT*, both at SCQF level 6.

Learners need to be familiar with appropriate methods, including textual, graphic and photographic, to record, reference and organise notes and drafts. Although *Communication* skills are not formally assessed, checklists of requirements could be useful as a support. Learners should be expected to analyse, produce and present information and materials to standards acceptable in industry, and to express essential ideas and information accurately and coherently. They should be encouraged to consider the most appropriate approach to *Working with Others* and to review their own skills in communicating with clients, all providing the learner with opportunities to develop the Core Skill *Communication* at SCQF level 6. This will require analysis of media and methods used to ensure effectiveness and accuracy. Individual and group discussions with the assessor reinforce analytical evaluation of approaches to creative design solutions and could enhance the Core Skill of *Working with Others* at SCQF level 5.

History of changes

Version	Description of change	Date

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced qualifications.

FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our Centre Feedback Form.

General information for learners

Unit title: Computer Aided Architectural Design and Technology: Model Making (SCQF level 7)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This Unit has been designed to allow you to explore the processes involved in the production of an architectural model. You will be encouraged to work to professional standards at all times and produce the quality of model expected in real, working environments.

This Unit will provide you with an insight into the importance of retrieving, processing, planning and implementation of information required in the production of an architectural model. Model-making skills will provide you with the ability to communicate essential, 3-dimensional ideas in a practical and professional manner.

This Unit has been developed as an optional Unit within the SQA Advanced Certificate in Computer Aided Architectural Design and Technology framework and will allow you to progress to more advanced design-based Units at SQA Advanced Diploma level, or exit the SQA Advanced Certificate programme with the practical skills reflective of model-making practitioners in industry.

The Unit will be delivered as a project based experience and is likely to incorporate working with others to develop appropriate solutions. You will be required to work independently when examining the use of tools, equipment and safety protocols relevant to the subject.

The majority of assessment activity within the Unit is practical, with a strong, learner-led design base, and also includes some additional, observed elements.

As you will work extensively with paper-based and electronic sources of primary data, conduct research and analyse problems, as well as consider a range of techniques used in the communication of design solutions and ideas, you will have the opportunity within this Unit to develop Core Skills in *Communication, Problem Solving, Information and Communication Technology (ICT), Numeracy* at SCQF level 6 and *Working with Others* all at SCQF level 5, although there is no automatic certification of Core Skills or Core Skills components.