SCQF level 6
Unit Specification

3D and Pictorial Graphic Communication

SCQF: level 6 (9 SCQF credit points)

Unit code: J252 76

Unit outline

The general aim of this Unit is to help learners to develop their creativity and presentation skills within a 3D and pictorial graphic communication context. It will enable learners to initiate, plan, develop and communicate ideas graphically, using three-dimensional graphic techniques. Learners will develop a number of skills and attributes within a 3D graphic communication context, including spatial awareness, visual literacy, and the ability to interpret given drawings, diagrams and other graphics. Learners will evaluate the effectiveness of their own and given graphic communications to meet their purpose.

Learners who complete this Unit will be able to:

1 Produce and interpret pictorial sketches[1] and drawings
2 Produce 3D computer-aided designed models and associated production drawings
3 Produce pictorial and 3D illustrations of everyday objects
4 Plan and produce promotional publications incorporating pictorial and/or 3D models

This Unit available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in *Unit Assessment Support*

[1] Drawing and sketching refers to manual and/or electronic methods unless otherwise stated.

Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- National 5 Graphic Communication Course or relevant Units

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. For further information, please refer to the *Unit Support Notes.*

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

1 Produce and interpret pictorial sketches and drawings by:

1.1 Applying graphic communication skills to produce pictorial line sketches of everyday objects or buildings with complex features that demonstrate good proportion, line quality, and representation of the item
1.2 Applying graphic communication skills to produce pictorial line drawings of everyday objects or buildings with complex features that demonstrate accuracy in proportion, line quality, type and representation of the item
1.3 Describing and justifying the use of the main types of 3D and pictorial graphic communication employed in the design, manufacturing and marketing of a product

Outcome 2

The learner will:

2 Produce 3D computer-aided designed models and associated production drawings by:

2.1 Applying computer-aided design skills accurately and effectively and using appropriate assembly techniques to create 3D models of everyday objects with complex features and technical detail
2.2 Describing and justifying 3D modelling techniques used to generate models of everyday objects with complex features
2.3 Applying computer-aided design skills, knowledge and understanding accurately and effectively and using appropriate drawing standards to add textual and numerical information to pictorial computer-aided designed work

Outcome 3

The learner will:

3 Produce pictorial and 3D illustrations of everyday objects by:

3.1 Illustrating preliminary pictorial sketches or drawings of everyday objects, to interpret the light source, surface texture and materials
3.2 Creating a rendered 3D computer-aided designed model of a complex everyday object to interpret the light source, with tonal change, surface texture and materials
3.3 Using computer-aided design software appropriately to create an environment or scene with relevant visual impact, applying surface texture and materials, to situate and effectively enhance a pictorial illustration

Outcome 4

The learner will:

4 Plan and produce promotional publications incorporating pictorial and/or 3D models by:

4.1 Designing a preliminary layout to incorporate a pictorial and/or 3D model to create relevant visual impact in response to a brief or theme
4.2 Producing promotional publications to incorporate a pictorial and/or 3D model
4.3 Evaluating the effectiveness of the format to its target audience in relation to design principles and elements
4.4 Describing the purpose of 3D modelling in commercial/industrial settings, the impact on the environment and society

Evidence requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

Evidence is required that the learner has met the Outcomes and Assessment Standards.

Evidence may be a combination of written, oral and graphical.

In general, Outcomes may be met using either manual graphics techniques or electronic techniques, or a combination of both manual and electronic. When an Outcome or Assessment Standard specifically refers to a task that can only be carried out using manual techniques or electronic techniques, then those must be used.

Evidence may be presented for individual Outcomes or it may be gathered for the Unit as a whole through combining assessment holistically in one single activity. If the latter approach is used, it must be clear how the evidence covers each Outcome.

For Outcome 3, a ‘suitable environment’ might be the internal corner of a kitchen worktop, ie a surface and two walls, enabling a light source to cast shadows and/or reflections or any other environment with those capabilities.

For this Unit, learners will be required to provide evidence of:

- skills in interpreting a range of pictorial and 3D preliminary, production and promotional graphics
- skills in creating a range of pictorial and/or 3D preliminary, production and promotional graphics
- knowledge and understanding of appropriate drawing standards, protocols, and conventions in commercial/industrial settings
- an understanding of techniques and terminology involved in the production of 3D graphics and 3D graphic displays
- an understanding of how graphic communication technologies impact on society and the environment

Exemplification of assessment is provided in *Unit Assessment Support*.
Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes.*

Assessment standard thresholds

If a candidate successfully meets the requirements of the specified number of Assessment Standards they will be judged to have passed the Unit overall and no further re-assessment will be required.

The specific requirements for this Unit is as follows:

- 9 out of 13 Assessment Standards must be achieved.

It should be noted that there will still be the requirement for candidates to be given the opportunity to meet all Assessment Standards. The above threshold has been put in place to reduce the volume of re-assessment where that is required.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy

2.2 Money, time and measurement

4 Employability, enterprise and citizenship

4.2 Information and communication technology (ICT)

5 Thinking skills

5.3 Applying
5.4 Analysing and evaluating
5.5 Creating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work.* The level of these skills should be at the same SCQF level of the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit Support Notes.*

Appendix: Unit support notes

Introduction

These support notes are not mandatory. They provide advice and guidance on approaches to delivering and assessing this Unit. They are intended for teachers and lecturers who are delivering this Unit. They should be read in conjunction with:

- the *Unit Specification*
- the *Unit Assessment Support packs*

Developing skills, knowledge and understanding

Teachers and lecturers are free to select the skills, knowledge, understanding and contexts which are most appropriate for delivery in their centres.

Approaches to learning, teaching and assessment

Centres should be very clear on what represents the capability and creativity of the learner and that of the software when making assessment judgments. Software wizards for items like templates should not be accredited to the learner.

Printed copies of digital evidence must be supplied for verification.

Skills, knowledge and understanding for the assessment of this unit

The following provides details of skills, knowledge and understanding sampled in this unit assessment:

Skills, Knowledge and Understanding	
Graphic types	Describing and justifying the use of the main types of 3D and pictorial graphics in the design, manufacturing and marketing of a product or publication and producing effective preliminary, production and promotional graphics. Conducting preliminary research and preparing an outline specification.
Manual techniques and/or computer-aided techniques	Selecting and applying manual and/or computer-aided and desktop publishing (DTP) graphic techniques and processes. Using graphic communication applications and a range of common graphic media, equipment and/or devices to produce effective and informative graphic communications.
Drawing standards, protocols and conventions	Applying recognised drawing standards, protocols and conventions in engineering and construction, including symbols and standards. ♦ line types: — dimension lines, centre line ♦ dimensioning: — linear, radial, angular, diameter, tolerance ♦ symbols for sections ♦ adding textual and numerical information ♦ third-angle projection system
Geometric shapes and forms	Producing pictorial graphics representing products, components, assemblies and other items. ♦ interpenetration ♦ intersections of right prisms and cylinders ♦ true shapes ♦ ellipses ♦ common geometric forms and partial cuts of those forms ♦ components built from various simple combinations of forms

Skills, Knowledge and Understanding	
Views and techniques	Appropriate selection and use of and 3D and pictorial views and techniques, when producing graphic communications: ♦ correct projection ♦ a range of sectional views (full, part, revolved, and stepped) and cut-aways ♦ assembly drawings (minimum three parts) ♦ auxiliary views ♦ exploded views (full and sectioned) ♦ oblique, isometric and planometric views ♦ use of appropriate scales
Techniques in sketching (paper-based and/or using electronic tablets or similar devices)	Applying electronic and/or manual sketching techniques: ♦ proportion ♦ line quality ♦ vanishing points ♦ sketching pictorial views ♦ single- and two-point perspective ♦ oblique and isometric forms
Illustration techniques using manual and/or computer-aided formats	Using illustration techniques to create effective and informative graphic communications for representing: ♦ light ♦ shadow ♦ reflection ♦ tone ♦ layout ♦ material ♦ texture 3D-rendering techniques: ♦ light source ♦ materials ♦ reflections ♦ shade ♦ sited environment ♦ visual enhancement techniques ♦ creating scenes that place 3D models in relevant contexts.

Skills, Knowledge and Understanding	
Producing effective promotional documents	Applying and using: ♦ colour theory: — warm, cool, contrast, harmony, accent, advancing and receding ♦ design elements and principles: — line, shape, texture, value, mass/weight, alignment, balance, contrast, depth, dominance, emphasis, proportion, rhythm, unity/proximity, white space, grid structure ♦ Techniques used to create promotional documents and graphic displays. ♦ Presenting research/investigation and generating ideas for work to support/justify a graphic communication proposal and evaluating the effectiveness of the format.
Computer-aided design (CAD)	Applying generic techniques, customs and practices used across a range of 2D and 3D CAD packages to create 3D and pictorial views: ♦ 2D-drawing tools: — line, circle, rectangle, ellipse, trim, array (linear, box and radial), offset, mirror, project edge, extend, fillet, chamfer ♦ modelling features: — extrude, revolve, loft, helix, extrude/sweep along a path ♦ modelling edits: — shell, fillet (regular/irregular), chamfer (regular/irregular), mirror, array (linear, box and radial), add, subtract, intersect ♦ 2D constraints: — linear, radius, diameter, perpendicular, parallel, fixed, tangent, concentric ♦ terminology: — component, assembly, sub-assembly, work-plane/plane, axis, feature, profile, sketch, face, edge, datum, suppress ♦ assembly: — 3D constraints (mate, align, centre axis, orientate, offset, tangent), stock/library components
Desktop publishing (DTP)	Applying and using generic DTP terms and techniques including: ♦ planning strategies: — thumbnails, visuals and annotation ♦ generic DTP terms and techniques: — copy/paste, import/export — single- and multi-page format — page size, orientation, grid, guides, snap, master page, layers, document sizing — cropping (square and full cropping), rotate, text box, handles,

Skills, Knowledge and Understanding	
	text wrap, flow text along a path, extended text — colour fill, colour picking, textured fills, gradient fill, transparency, drop shadow — serif, sans serif and script fonts, font styles, placeholder text (lorem ipsum), reverse, drop caps — column, margin, gutter, caption, header, running headline, heading, title, footer, folio, column rule/rule, indent, hanging indent, line spacing, pull quote, justification — proofs (pre-press), registration marks, crop marks, bleed ♦ file types: — raster (tiff, jpg, png, bmp), vector (svg, dxf) and their features
Graphic communication technology and society	The impact and influence of CAD systems and graphic communication technologies on industry and society: ♦ the paperless office ♦ use of recycled materials ♦ CAD, as it supports manufacturing and other industries ♦ DTP in marketing and promotional activities ♦ remote working ♦ communication crossing international boundaries
Safe working	The safe working practices and systems that support graphic communication activities in studios and other working environments.

Combining assessment within Units

Assessment could be combined in this Unit by holistically assessing all the Outcomes of the Unit in a single assessment. When assessment within the Unit is holistic, teachers and lecturers should take particular care to track the evidence for each individual Outcome.

Administrative information

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Superclass: CE

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
2.0	Changes to wording in Outcomes 3 and 4 to improve clarity — removal of 'of geometric forms and' (Outcome 3), and addition of 'promotional publications incorporating' (Outcome 4). Previous AS 1.1 has now been split into 1.1 and 1.2 – line sketches and line drawings respectively – for consistency with other levels. The words '3D and pictorial' in AS 1.3 added for Unit consistency. Rewording of AS 2.2 — from 'Applying computer-aided design draughting skills…' to 'Describing and justifying 3D modelling techniques...' — to meet the assessment requirements of the Outcome. Changes to wording in AS 3.1 to clarify that this is 'preliminary' pictorial sketches. AS 3.2 - 3.4 reworded to provide clarity and to reflect the Outcome. Rewording of AS 4.1 'promotional' amended to 'preliminary'. AS 4.2 – 4.4 reworded to provide clarity and to reflect the Outcome.	Qualifications Development Manager	April 2014
2.1	Reference to draughting removed throughout.	Qualifications Manager	April 2015
3.0	Level changed from Higher to SCQF level 6. Unit support notes added. Assessment standard threshold added.	Qualifications Manager	September 2018
4.0	Unit code updated	Qualifications Manager	July 2019

Note: readers are advised to check SQA's website: www.sqa.org.uk to ensure they are using the most up-to-date version of the Unit Specification.