

<b>Unit Title:</b>	<b>Creating drawings from 3D solid models</b>
OCR unit number	7
Level:	2
Credit value:	2
Guided learning hours:	20
Unit reference number	D/503/5860

## Unit purpose and aim

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This unit follows on the work undertaken in Unit 6 but can be delivered discreetly should the learner have access to models or knowledge of 3D solid modelling.

This unit will allow learners to develop skills in the production of 2D engineering drawings directly from 3D solid models within a parametric modelling system. Learners will develop an understanding of the link between 3D geometry and 2D drawings within a parametric system. They will develop their understanding of the importance of templates and be able to setup their own drawing formats and templates. Learners will develop knowledge of first and third angle projection, drawing standards, dimensioning and the production of multiple types of drawing view. Learners should be encouraged to develop their understanding of correct drawing techniques through a range of different activities.

Learning Outcomes	Assessment Criteria	Teaching Content
<p><b>The Learner will:</b></p> <p>1 Know the features of 2D engineering drawing creation in parametric modelling software</p>	<p><b>The Learner can:</b></p> <p>1.1 Identify the key features of 2D drawing in parametric modelling software interface</p>	<ul style="list-style-type: none"> <li>• Parametric link between 3D solid models and 2D drawings: <ul style="list-style-type: none"> <li>○ associative features</li> <li>○ associative dimensions</li> <li>○ related views and geometry</li> </ul> </li> <li>• Drawing templates: <ul style="list-style-type: none"> <li>○ corporate identity</li> <li>○ company standards</li> <li>○ ensuring conformity across departments</li> </ul> </li> <li>• Key elements of the 2D drawing interface: <ul style="list-style-type: none"> <li>○ main toolbars</li> <li>○ primary features</li> <li>○ views and projections</li> </ul> </li> </ul>

Learning Outcomes	Assessment Criteria	Teaching Content
<p>2 Be able to produce drawing formats and templates</p>	<p>2.1 Create drawing formats            2.2 Create drawing templates            2.3 Insert images or logos into templates            2.4 Insert linked annotations into templates            2.5 Specify units and projection within templates</p>	<ul style="list-style-type: none"> <li>• Custom drawing formats:               <ul style="list-style-type: none"> <li>○ produce border outlines</li> <li>○ add critical information headings</li> <li>○ save the format</li> </ul> </li> <li>• Drawing templates:               <ul style="list-style-type: none"> <li>○ import a format</li> <li>○ specify standards</li> <li>○ save the template</li> </ul> </li> <li>• Annotations that are linked to critical values within the solid model eg:               <ul style="list-style-type: none"> <li>○ part name</li> <li>○ material</li> </ul> </li> <li>• Units and projection:               <ul style="list-style-type: none"> <li>○ mm</li> <li>○ Inches</li> <li>○ first / third angle</li> </ul> </li> </ul>
<p>3 Be able to create different drawing views</p>	<p>3.1 Create standard views in first and third angle projection            3.2 Create additional projected views            3.3 Create isometric and auxiliary views            3.4 Create section views</p>	<ul style="list-style-type: none"> <li>• First and third angle orthographic projection:               <ul style="list-style-type: none"> <li>○ position of views</li> <li>○ standard format</li> <li>○ symbol</li> </ul> </li> <li>• Projected views</li> <li>• isometric and auxiliary views</li> <li>• Section views</li> </ul>
<p>4 Be able to apply dimensions and annotations to drawings</p>	<p>4.1 Modify dimension standards            4.2 Apply multiple dimensions to drawings            4.3 Add annotations to drawings</p>	<ul style="list-style-type: none"> <li>• Modify dimension standards eg:               <ul style="list-style-type: none"> <li>○ BSI</li> <li>○ ISO</li> <li>○ ANSI</li> <li>○ Custom</li> </ul> </li> <li>• Range of dimensions to drawings:               <ul style="list-style-type: none"> <li>○ auto-dimension</li> <li>○ individual dimensions</li> </ul> </li> <li>• Annotations eg:               <ul style="list-style-type: none"> <li>○ critical notes</li> <li>○ surface finish</li> <li>○ materials</li> <li>○ manufacturing instructions</li> </ul> </li> </ul>

## Assessment

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This unit is centre assessed and externally verified. In order to achieve the unit you must produce a portfolio of evidence which, on request, will need to be made available to the OCR external verifier. Portfolios of work must be produced independently and centres must confirm to OCR that the evidence is authentic.

## Evidence requirements

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Learners will evidence that they can produce a range of 2D drawings from 3D CAD data. It is possible for the drawings to be linked to the models produced in Unit 6.

Learners will evidence that they can produce their own templates and drawing formats. They will, insert images or logos and linked annotations into templates. Additionally create views in first and third angle projection, produce isometric, sectional and auxiliary views and dimension to appropriate standard specifying units and projection within templates.

## Guidance on assessment and evidence requirements

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Tutors should ensure that learners have the opportunity to produce 2D drawings from 3D models. Learners should know about differing projections (first and third angle), effective dimensioning, types of view and general engineering drawing standards. It may be that this is supported by other engineering delivery. Tutors may want to link the drawings to the models produced in Unit 6.

The final assessment should allow learners to produce a series of drawings that incorporate a broad range of views, dimensions and annotations to appropriate standards.

## National Occupational Standards (NOS) mapping/signposting

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**NOS can be viewed on the relevant Sector Skills Council's website or the Occupational standards directory at [www.ukstandards.co.uk](http://www.ukstandards.co.uk).**

Occupational standards	Unit number	Title
Engineering Technical Support Suite 2 2007	TS2-02	Using and Interpreting Engineering Data and Documentation
Engineering Technical Support Suite 2 2007	TS2-04	Producing/Modifying Mechanical or Fabrication Engineering Drawings using a CAD System
Engineering Technical Support Suite 2 2007	TS2-05	Producing/Modifying Electrical or Electronic Engineering Drawings using a CAD System
Engineering Technical Support Suite 2 2007	TS2-07	Producing/Modifying Engineering CAD Models (Drawings) using a CAD System
Mechanical Manufacturing Engineering Suite 2 2008	O45NMME2-02	Using and Interpreting Engineering Data and Documentation
Mechanical Manufacturing Engineering Suite 2 2008	O45NETS3-02	Using and Interpreting Engineering Data and Documentation
Design	DES10	Create visual designs

Design	DES23	Create 2D Designs using a Computer Aided Design System
Design and Draughting	O15NDD01ECRS2.04	Read and extract information from engineering drawings and specifications
Design and Draughting	O15NDD03ECRS1.19	Complete chosen engineering designs
Design and Draughting	O15NDD04ECRS2.01	Review technical information to produce detailed engineering drawings
Design and Draughting	O15NDD05ECRS2.02	Produce detailed drawings to support engineering activities
Design and Draughting	O15NDD09ECRS2.06	Communicating design options

## Functional skills signposting

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This section indicates where learners may have an opportunity to develop their functional skills.

Functional Skills Standards					
English		Mathematics		ICT	
Speaking and Listening		Representing		Use ICT systems	✓
Reading		Analysing		Find and select information	✓
Writing		Interpreting		Develop, present and communicate information	✓

## Resources

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### Equipment

For effective delivery of this unit centres should have access to the following resources and equipment.

- Computer system with Internet access, word processing, spread sheet, business presentation and parametric modelling software.
- 3D Parametric Modelling software e.g. Solidworks, Solid Edge, Inventor, Pro/Engineer.
- A wide range of examples, drawings and tasks.

## Additional information

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For further information regarding administration for this qualification, please refer to the OCR document '*Admin Guide: Vocational Qualifications*' (A850) on the OCR website [www.ocr.org.uk](http://www.ocr.org.uk).