

**Unit Title:** Data representation and manipulation for IT

OCR unit number: 29  
 Unit reference number: D/601/3206  
 Level: 2  
 Credit value: 7  
 Guided learning hours: 60

**Unit aim**

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The aim of this unit is that learners will:

- Manipulate real numbers and integers
- Use co-ordinate systems and vectors, and linear transformations
- Use simple functions and basic algebraic operations
- Apply Boolean algebra to problem situations

Learning Outcomes	Assessment Criteria
<p><b>The Learner will:</b></p> <p>1 Manipulate real numbers and integers</p>	<p><b>The Learner can:</b></p> <p>1.1 Describe the difference between real numbers and integers</p> <p>1.2 Express numbers in power and scientific notation</p> <p>1.3 Perform arithmetic on numbers in power and scientific notation including multiplication and division of powers</p> <p>1.4 Round real numbers and estimate the resulting error</p> <p>1.5 Describe how real numbers and integers are represented in computer memory</p>
<p>2 Use co-ordinate systems and vectors, and linear transformations</p>	<p>2.1 Describe two dimensional co-ordinate systems</p> <p>2.2 Represent simple shapes by finding the co-ordinates of the vertices</p> <p>2.3 Describe vectors</p> <p>2.4 Produce the polar representation of vectors</p> <p>2.5 Offset and scale shapes described by co-ordinates</p> <p>2.6 Convert between linear to polar co-ordinates</p> <p>2.7 Describe co-ordinate systems used in programming output devices</p>

Learning Outcomes	Assessment Criteria
3 Use simple functions and basic algebraic operations	3.1 Express simple problems as mathematical equations 3.2 Simplify and change the subject of simple equations 3.3 Describe the concept of a function 3.4 Obtain the equation of a straight line from a graph 3.5 Describe the basic properties of a circle and triangle 3.6 Apply trigonometric and inverse trigonometric functions
4 Apply Boolean algebra to problem situations	4.1 Describe how Binary states can be used to represent physical systems 4.2 Identify and label the inputs and outputs of a binary representation 4.3 Produce a truth table corresponding to a binary representation 4.4 Express a truth table as a Boolean equation 4.5 Simplify a Boolean equation using algebraic methods

## Assessment

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The qualification has been designed to develop knowledge, understanding and skills in the full range of functions involved in the planning and control, hardware, software and systems installation, software solutions and the production of customer support materials. It also provides opportunities for learners to study towards system and network management, to specialise in one or more specific programming languages in addition to being able to take units that are vendor specific.

Each unit within the specification is designed around the principle that candidates will build a portfolio of evidence relating to progression towards meeting the unit assessment criteria.

The unit assessment criteria reflect the demands of the learning outcomes for each unit.

In order for candidates to be able to effectively progress towards meeting the requirements of each assessment criteria, tutors must make sure that the supporting knowledge, understanding and skills requirements for each criteria are fully addressed. The identified knowledge, understanding and skills are not exhaustive and may be expanded upon or tailored to particular contexts to which the unit is being taught and the assessment criteria applied.

We recommend that teaching and development of subject content and associated skills be referenced to real vocational situations, through the utilisation of appropriate industrial contact, vocationally experienced delivery personnel, and real life case studies.

All the learning outcomes and assessment criteria must be clearly evidenced in the submitted work, which is externally moderated by OCR.

Results will be Pass or Fail.

## Guidance on assessment

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Candidates do not have to achieve units in any particular order and tutors should tailor learning programmes to meet individual candidate needs. It is recommended that, wherever possible, centres adopt a holistic approach to the delivery of the qualification and identify opportunities to link the units.

Centres are free to deliver this qualification using any mode of delivery that meets the needs of their candidates. Whatever mode of delivery is used, centres must ensure that learners have access to appropriate resources and consider the candidates' complete learning experience when designing learning programmes. This is particularly important in relation to candidates studying part time alongside real work commitments where candidates may bring with them a wealth of experience that should be utilised to maximum effect by tutors and assessors.

It is difficult to give a detailed answer to how much evidence is required as it depends on the type of evidence collected and the judgement of assessors. The main principles, however, are as follows: for a candidate to be judged competent in a unit, the evidence presented must satisfy:

- all the items listed, in the section 'Learning Outcomes'
- all the areas in the section 'Assessment Criteria'

Questioning the candidate is normally an ongoing part of the assessment process, and is necessary to:

- test a candidate's knowledge of facts and procedures
- check if a candidate understands principles and theories *and*
- collect information on the type and purpose of the processes a candidate has gone through
- candidate responses must be recorded

The quality and breadth of evidence provided should determine whether an assessor is confident that a candidate is competent or not. Assessors must be convinced that candidates working on their own can work independently to the required standard.

## Additional information

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