Unit Title:	**Creating an Object-Oriented Computer Program**
OCR unit number	12
Level:	2
Credit value:	7
Guided learning hours:	60
Unit reference number:	A/601/3181

Candidates undertaking this unit must complete real work activities in a work environment. Simulation is only allowed in exceptional circumstances (please refer to the centre handbook for further details).

Unit purpose and aim

This unit introduces the fundamental concepts of object-oriented computer languages and their use to implement, refine and test a computer program.

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
The Learner will: 1 Implement software using object-oriented programming	**The Learner can:** 1.1 Select, declare and initialise variable and data structure types and sizes to meet given requirements 1.2 Define relationships between objects 1.3 Implement object behaviours using control structures 1.4 Declare file structures 1.5 Use standard input/output commands 1.6 Use operators and predefined functions 1.7 Make effective use of an Integrated Development Environment (IDE)	Candidates must have an understanding of: • how to select, declare and initialise the following: - variables - data structure types and sizes • the relationships between objects • file structures and declaration • a range of standard input/output commands. • a range of operators and pre-defined functions. • an Integrated Development Environment (IDE)
2 Refine an object-oriented program to improve quality	2.1 Follow an agreed standard for naming, comments and code layout 2.2 Implement data validation for inputs 2.3 Implement opportunities error handling and reporting 2.4 Create on-screen help to assist the users of a computer program	Candidates must have an understanding of: • naming conventions used within programming • the purpose of comments in programming and how to implement them • the appropriate layout for programme code • a range of data validation

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
		methods for inputs • what mechanisms are available for error handling and reporting and be able to implement them • how to create on-screen help to assist the end-user
3 Test the operation of an object-oriented driven program	3.1 Use of the debugging facilities available in the IDE 3.2 Determine expected test results from given test data 3.3 Compare actual results against expected results to identify discrepancies	Candidates must have an understanding of: • appropriate debugging tools and how they are used within the IDE • what results to expect from given test data • comparing the actual test results with the expected results and identify discrepancies

Assessment

Candidates undertaking this unit must complete real work activities in order to produce evidence to demonstrate they are occupationally competent. Real work is where the candidate is engaged in activities that contribute to the aims of the organisation by whom they are employed, for example in paid employment or working in a voluntary capacity.

Simulation is only allowed for aspects of units when a candidate is required to complete a work activity that does not occur on a regular basis and therefore opportunities to complete a particular work activity do not easily arise. When simulation is used, assessors must be confident that the simulation replicates the workplace to such an extent that candidates will be able to fully transfer their occupational competence to the workplace and real situations.

Internal quality assurance personnel must agree the use of simulated activities before they take place and must sample all evidence produced through simulated activities.

It is the assessor's role to satisfy themselves that evidence is available for all performance, knowledge and evidence requirements before they can decide that a candidate has finished a unit. Where performance and knowledge requirements allow evidence to be generated by other methods, for example by questioning the candidate, assessors must be satisfied that the candidate will be competent under these conditions or in these types of situations in the workplace in the future. Evidence of questions must include a written account of the question and the candidate's response. Observations and/or witness testimonies must be detailed and put the evidence into context ie the purpose of the work etc.

All of the assessment criteria in the unit must be achieved and clearly evidenced in the submitted work, which is externally assessed by OCR.

Evidence for the knowledge must be explicitly presented and not implied through other forms of evidence.

Evidence requirements

All aspects of the assessment criteria must be covered and evidence must be available that shows where and how the assessment criteria have been achieved.

Assessment Criterion 1

For a given scenario a candidate must identify the functionality of the programme and intended end user.

A plan of their program to include:

- selection, declaration and initialisation of variables
- data structure types and sizes
- defining the relationship between the objects
- declaring relevant file structures
- using control structures to implement object behaviours
- using standard input/output commands
- using operators and predefined functions
- the effective use of IDE

Candidates must create their program design.

Assessment Criterion 2

Candidates must provide printouts of their code confirming that they have used an agreed standard for:

- naming
- using comments
- code Layout

Candidates must provide an explanation of the following:

- key features of naming conventions
- the purpose of comments in programming
- why good code layout is important

Candidates must identify and implement the following:

- data validation for inputs
- error handling and reporting mechanisms

Candidates must provide evidence of creating on screen help to assist a range of end users from basic to the more experienced.

Assessment Criterion 3

Candidates must:

- identify the debugging tools that are available within their IDE and explain how they will be used.
- provide evidence of using relevant debugging facilities available in the IDE

- identify the expected results from given test and provide evidence of comparing the actual results with the expected results, identifying any discrepancies.

Candidates are encouraged to choose activities which will allow them to cover all or a majority of the criteria at one time. It is not necessary to use different activities for each element of the criterion.

Guidance on assessment and evidence requirements

Evidence can reflect how the candidate carried out the process or it can be the product of a candidate's work or a product relating to the candidate's competence.

For example: The process that the candidate carries out could be recorded in a detailed personal statement or witness testimony. It is the assessor's responsibility to make sure that the evidence a candidate submits for assessment meets the requirements of the unit.

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

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'

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

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 .