

Achievement Standard

Subject Reference	Digital Technologies 3.46		
Title	Develop a complex computer program for a specified task		
Level	3	Credits	6
		Assessment	Internal
Subfield	Technology		
Domain	Digital Technologies		
Status	Registered	Status date	4 December 2012
Planned review date	31 December 2016	Date version published	12 December 2013

This achievement standard involves developing a complex computer program for a specified task.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Develop a complex computer program for a specified task. 	<ul style="list-style-type: none"> Skilfully develop a complex computer program for a specified task. 	<ul style="list-style-type: none"> Efficiently develop a complex computer program for a specified task.

Explanatory Notes

- This achievement standard is derived from Level 8 of the Technology learning area in *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007; and is related to the material in the *Teaching and Learning Guide for Technology*, Ministry of Education at <http://seniorsecondary.tki.org.nz>.

Further information can be found at <http://www.technology.tki.org.nz/>.

Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools*, Ministry of Education at <http://technology.tki.org.nz/Curriculum-support/Safety-and-Technology-Education>, and the Health and Safety in Employment Act 1992.

- Develop a complex computer program for a specified task* involves:
 - designing and implementing a program that includes variables, an indexed data structure, and a modular structure including details of the procedural structures of the modules
 - including a working graphical user interface with different sources of event generating components and event handling, and using classes and objects to encapsulate data and methods

- setting out the program code clearly and documenting the program with comments
- testing and debugging the program to ensure it works on a sample of expected input cases.

Skilfully develop a complex computer program for a specified task involves:

- using well-chosen modular and procedural structures, scope and encapsulation for data and methods, graphical user interface and event handling mechanisms
- documenting the program with variable and module names and comments that accurately describe code function and behaviour
- following a disciplined design and implementation process, with documented cycles of incremental development and comprehensive testing process, to ensure that the program works on inputs that include both expected and boundary cases.

Efficiently develop a complex computer program for a specified task involves:

- ensuring that the overall modular and procedural design, graphical user interface, and event handling design, are a well-structured, logical decomposition of the task, and that the program is flexible and robust
- setting out the program code concisely and documenting the program with comments that explain and justify decisions
- comprehensively testing and debugging the program in an organised and time effective way to ensure the program is correct on expected, boundary and invalid input cases.

- 3 The programming language for this standard must be a text-based Object-oriented programming language that supports graphical user interfaces (GUIs) and event based programming.
- 4 The platform for the program could be a personal computer, a mobile device, or a web browser. The program must involve graphical elements such as widgets, images, and/or shapes, and must respond to event based input from the user.
- 5 *A complex computer program* is one that has a modular structure; an indexed data structure (eg array or list); input and output; procedural structures that combine sequential, conditional, and iterative structures; a graphical user interface and event handling; and that includes classes and objects. Inheritance is not required.
- 6 Any code that is auto-generated by an Integrated Development Environment (IDE) cannot be used as evidence of student code.
- 7 *A specified task* refers to a set task which requires the development of a complex computer program to resolve. The task must be of sufficient rigour to allow the student to meet the standard and needs to be agreed prior to the program being developed. It may be teacher-given or developed in negotiation with the student.
- 8 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-aligned-standards/Technology/Level-3-Technology>.

Replacement Information

This achievement standard, AS91633, AS91635, and AS91642 replaced unit standard 13402 and AS90685.

Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233