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   Expiring   **Status date**   29 November 2018

This achievement standard is expiring. Assessment against the standard must take place before the expiry date set out below.

Expiry date   31 December 2020   **Date version published**   29 November 2018

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

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Develop a complex computer program for a specified task.	• Skilfully develop a complex computer program for a specified task.	• Efficiently develop a complex computer program for a specified task.

Explanatory Notes

1   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 at Work Act 2015.

This standard is also derived from *Te Marautanga o Aotearoa.* For details of *Te Marautanga o Aotearoa* achievement objectives to which this standard relates, see the Papa Whakaako for the relevant learning area.

2   *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 class(es) 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:
   - 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
   - using variables, constants, and derived values effectively so as to increase the flexibility and robustness of the program
   - 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 may 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 (e.g. 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 class(es) and objects. Inheritance is not required.

6   *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.

7   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 was replaced by AS91906.

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