Achievement Standard

Subject Reference Digital Technologies 1.46

Title Construct a basic computer program for a specified task

Level 1 **Credits** 3 **Assessment** Internal

Subfield Technology

Domain Digital Technologies

Status Expiring **Status date** 17 November 2011

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

Expiry date 31 December 2018 **Date version published** 23 November 2017

This achievement standard requires constructing a basic computer program for a specified task.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Construct a basic computer program for a specified task.	• Skilfully construct a basic computer program for a specified task.	• Efficiently construct a basic computer program for a specified task.

Explanatory Notes

1   This achievement standard is derived from Level 6 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   *Construct a basic computer program for a specified task* involves:
   - implementing a plan for a basic program in a suitable programming language
   - setting out the program code clearly and documenting the program with comments
   - testing and debugging the program to ensure that it works on a sample of expected inputs.

   Skilfully construct a basic computer program for a specified task involves:
   - independently implementing the plan for a basic program in a suitable programming language that uses a procedural structure with well-chosen actions, conditions and control structures
   - documenting the program with variable names and comments that accurately describe code function and behaviour
   - testing and debugging the program in an organised way to ensure that it works on expected and boundary inputs.

   Efficiently construct a basic computer program for a specified task involves:
   - constructing a basic program which uses actions, conditions and control structures effectively to increase the flexibility and robustness of the program
   - using an effective procedural structure that results in a well-structured, logical solution to the task
   - setting out the program code concisely and documenting the program with succinct 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 inputs.

3   The programming language could be graphical, drag-and-drop or text based. The language chosen must support the required data types and procedural structures, and good comment facilities.

4   A *basic computer program* is a program written in a programming language, that uses:
   - variables involving at least two types of information (eg numeric, characters, text) and assignment
   - sequence, selection and iteration control structures
   - predefined actions (e.g. predefined methods, functions, or procedures)
   - input from a user, sensors, or other external source.

5   *A specified task* refers to a set task which requires the development of a basic 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 constructed. It may be teacher-given or developed in negotiation with the student. It is expected that most students constructing a program for this standard will have developed a plan for a basic computer program for this task. If this is not the case, the teacher should provide the student with an abstract plan to guide their program development but one which cannot be directly transcribed to the programming language.

6   Actions are the atomic statements of the program (including the use of predefined methods, functions, or procedures). Conditions are logical expressions within conditional and iterative structures that control the choice or repetitions.

7   Well-chosen actions, conditions and control structures are those where the resulting sequence of actions correctly performs the task and has no unintended behaviour or consequences.

8   Ways of making a program more flexible and robust must include using actions, conditions and control structures effectively and may also include but are not limited to: checking input data for validity; correctly handling expected, boundary and invalid inputs; and using constants, variables and derived values in place of literals.

9   An effective procedural structure is one where each individual control structure has a clear and well defined purpose within the structure of the program, and which has no unnecessary duplication or repetition.

10   Conditions of Assessment related to this achievement standard can be found at http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards.

Replacement Information
This achievement standard and AS91075 were replaced by AS91883.

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