

**Internal Assessment Resource**

**Digital Technologies & Hangarau Matihiko Level 1**

This resource supports assessment against Achievement Standard 91882**[[1]](#footnote-1)**

**Standard title:** Develop a computer system

**Credits:** 4

**Resource title:** Portable Gaming Console

**Resource reference:** Digital Technologies & Hangarau Matihiko 1.6B Version 2

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| This resource:   * Clarifies the requirements of the achievement standard * Supports good assessment practice * Should be subjected to the school’s usual assessment quality assurance process * Should be modified to make the context relevant to students in their school/kura environment and ensure that submitted evidence is authentic |

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| Date version published by Ministry of Education | November 2019 Version 2  To support internal assessment from 2020 |
| Authenticity of evidence | Teachers/Kaiako must manage authenticity for any assessment from a public source, because students may have access to the assessment schedule or student exemplar material.  Using this assessment resource without modification may mean that students’ work is not authentic. The teacher may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

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**Teacher/Kaiako guidelines**

The following guidelines are supplied to enable teachers to carry out valid and consistent assessment using this internal assessment resource.

Teachers/kaiako need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing students/ākonga against it.

**Context/Te Horopaki**

This resource requires students to accurately develop a refined portable computer system using appropriate procedures and techniques. The students are given a scenario for development of the computer system, including the purpose and end-user of the computer system.

During the development of the computer system, students are required to assess the end-user needs to investigate, explain and justify components needed for their system. They then develop the computer system and troubleshoot and diagnose any issues with the system. Students should provide evidence of their development process, troubleshooting and testing procedures. Evidence can be provided through a variety of media including written documents, annotated images, diagrams, or video.

It is expected that students will have opportunities beforehand to practise the procedures and protocols required to set up hardware, software and peripherals on a computer system.

**Conditions/Ngā Tikanga**

Where a group approach is used, the teacher needs to ensure that there is opportunity for each student to provide evidence for all aspects of the standard.

The 4 credits for the achievement standard indicates that approximately 40 hours needs to be allocated for teaching, learning (in and out of the classroom) and assessment in a programme of study. You may want to give students guidance on appropriate style and format for their evidence portfolio.

This achievement standard does not assess format or style.

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

**Resource requirements/Ngā Rauemi**

Students will need access to the web, digital devices and information from a variety of sources, such as manufacturer manuals for components and equipment. Numerous examples and resources are available on the internet, which include kits, 3D-print schematics, bill of materials (BoM) etc.

Each student will require the following (teacher-given or negotiated with student):

1. Computer parts to build a basic portable computer system (for example Raspberry Pi, BBC Micro:bit or other depending on the computer parts given to students)
2. Tools e.g. anti-static straps, anti-static bags, screwdrivers
3. Operating system e.g. Linux, Android (students choose depending on requirements).

Students need to choose from a range of components. This is not just a build assessment. Students will need to justify what components that have used and why.

**Additional information/He Kōrero Atu**

Many students will have phones they can use to take photographs of their work, but it may be necessary to provide a camera in the classroom for student use.

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**Student/Ākonga instructions**

**Introduction/Kupu Arataki**

This assessment activity requires you to develop a portable gaming console for a 12-year old child that will occupy and put a child at ease during a long car trip.

You are going to be assessed on how accurate, refined and fit for purpose your completed computer system is.

You may work with others on this task but the final submission needs to demonstrate your own work toward the requirements of the task.

**Task/Hei Mahi**

Develop a portable gaming console for a 12-year old child who likes to listen to music and play games. As there is no access to the internet the console needs to be self contained. You will have access to a range of computer components to select from that are available at school.

**You will:**

1. Investigate the child’s needs. Make sure you consider hardware and software compatibility issues as well as their requirements – for example, cost, size, ease of use, portability and upgradeability. The power needs to last for the length of the car trip, or be able to be plugged into the vehicles 12V power supply.
2. Identify and describe the relevant implications that are the most important for your outcome.You should identify the implication, say what it means and what this might mean for your outcome. For example, you could:

* Describe what future proofing is. Describe how future proofing relates to your outcome. What might you need to include in your outcome to ensure this is addressed?
* Describe what usability and functionality are. What does this mean in relation to your outcome? What might you need to include in your outcome to ensure this is addressed?
* Describe what ethics is. Describe how ethics might relate to your outcome. What might you need to include in your outcome to ensure this is addressed?

1. Choose appropriate components from a range supplied by the teacher or you have organised for you, including hardware, software and peripherals. Explain the purpose and function of each part and component chosen. Justify why you have chosen the specific parts and components.
2. Install an appropriate operating system.
3. Accurately use appropriate tools, procedures and protocols to install and configure selected hardware, software and peripherals to ensure the outcome is fit for purpose for your end user (the child).
4. Test, troubleshoot and diagnose any given installation or configuration issues.
5. Provide evidence of the process and procedures used in creating the computer system. This must include evidence of how you have improved the computer system through the development and testing process. You may use annotated photos, videos and/or screen dumps to support your evidence.

**Assessment schedule/Mahere Aromatawai: Digital Technologies & Hangarau Matihiko** **91882 – Portable Gaming Console**

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| **Evidence/Judgements for Achievement/Paetae** | **Evidence/Judgements for Achievement with Merit/Kaiaka** | **Evidence/Judgements for Achievement with Excellence/Kairangi** |
| Develop a computer system.  The student has:   * used appropriate tools, procedures and protocols when installing and configuring hardware, software and peripherals for a purpose and end-user   **For example (partial evidence):**  *The student assembled a working computer from the collection of parts they selected using standard best practice procedures and ensuring that the computer met the boy’s requirements.*  *They have produced logs indicating: that their Raspberry Pi was able to boot successfully, that they had correctly written the SD card, and that they were using a known-good power supply, and keyboard.*  *When problems presented themselves during the assembly process, the fault indicator LEDs were identified and the fault resolution was documented.*  *The student was observed using correct protocols during installation of hardware, such as wearing an earthing wrist strap.*   * described relevant implications   **For example (partial evidence):**  *The student has described copyright: Copyright is a protection of Intellectual property that gives exclusive rights to the author(s) of a creative work.*  *Usability is about how easily the end user can accomplish tasks. It deals with issues like making the computer system easy to use and appropriate for the end users and purpose.*  *The examples above are indicative samples only* | Develop an informed computer system.  The student has:   * used information gained from testing procedures, diagnosing and troubleshooting, to inform development and to improve the quality of the computer system   **For example (partial evidence):**  *“I tested the device with both a portable keyboard and joystick and decided that it would be good to include a joystick with the system to improve playability of the games.”*  *“I ensured I had the very latest version of Raspbian, which is the best choice for first boot, and the default OS.”*   * explained the purpose and function of parts and components (hardware and software)   **For example (partial evidence):**  *The student chose a Raspberry Pi 3 because they want to use the 7” Touchscreen display to create an all-in-one game console.*  *“When first connecting the Pi to a power source, the onboard red LED should light. This indicates the device is getting the correct amount of power, and this LED should remain lit for the entire time the Pi remains powered, even if there is no network connection, or if the SD card is not connected.*  *If it flickers, or if it goes off, there is a problem with the way the device is powered. The first thing to check is the cable and the power supply unit.”*   * addressed relevant implications   **For example (partial evidence):**  *This is a portable gaming system and there are many pirated versions of games available for download. However, there are also open-source games that would not be breaking copyright and are just as much fun to play.*  *The student decided to use Raspbian as an operating system because unless you need special Linux capabilities, Raspbian is the recommended Linux kernel to install.*  *Raspbian is open-source and thus free to install and works well on a portable device.*  *The examples above are indicative samples only* | Develop a refined computer system.  The student has:   * accurately used tools, procedures and protocols when installing and configuring hardware and software to ensure the outcome is fit for purpose   **For example (partial evidence):**  *The student ensured the power supply was fit-for-purpose, as brownouts can lead to SD card corruptions and boot problems.*  *They have used zip tie or screwed nylon spacers to ensure the assembly is protected, from accidental damage, is robust, and neat and tidy to minimise chances of errors and improve reliability.*     * justified the choice of parts and components (hardware and software) used in the development of the computer system   **For example (partial evidence):**  *“You must ensure that you are using an SD card image that has the right version of the core files (comparable to a BIOS) and the right kernel. This means you need an image that is up-to-date for your machine. A good portable power supply that will supply 5 volts and at least 1 amp (5V 1A) is vital. A 5 volt 2 amp power supply can help some wifi USB adapters run more stable, however in this situation wifi is not suited due to the pairing a device as cellular coverage is not available in all areas”*  *“A device that fails to boot, may be a brownout caused by insufficient power supply or a weak microUSB cable (i.e. being too long, or having internal wires which are too thin)."*  *The examples above are indicative samples only* |

Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.

1. This achievement standard is derived from both *The New Zealand Curriculum* and *Te* *Marautanga o Aotearoa.* [↑](#footnote-ref-1)