

**Internal Assessment Resource**

**Digital Technologies & Hangarau Matihiko Level 1**

This resource supports assessment against achievement standard 91879[[1]](#footnote-1)

**Standard title:**  Develop a digital outcome to manage data

**Credits:** 4

**Resource title:** Data works

**Resource reference:** Digital Technologies & Hangarau Matihiko 1.3B 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 2To 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/ākonga 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/kaiako 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**

Students are required to develop a refined outcome to manage data.

This activity requires students to develop a digital outcome to structure, organise and query data related to a given dataset.

Teachers could also choose to integrate opportunities to present evidence for achievement standard 91877 *Develop a proposal for a digital outcome,* as part of a larger assessment project or achievement standard 91878 *Develop a design for a digital outcome* to assess the design for a digital outcome to manage data *and/or* 91880 *Develop a digital media outcome,* to assess the outcome for presenting the data. Teachers must ensure the rigour of the digital media outcome meets the requirements of AS91880.

The context of this resource is to enable the understanding of datasets. There are many available for use in New Zealand. Students will develop an understanding of an issue that could be communicated using the datasets and to present their findings. For example: The number of smog nights in Timaru over a year. Students could use their own regional data to find out the number of smog nights within their region.

Datasets that are available for use are available at<https://data.govt.nz/> and include the following categories:

* Land
* Health
* Local and Regional Government
* Environment and Conservation
* Transport
* Education
* State Sector Performance
* Population and Society

From the above contexts (or one of their own choice), students need to determine which dataset they will use and what features of the dataset will help determine the information to be shown. If working in class groups, each group could focus on one particular context (e.g. air quality) and pool their data. While data could be examined and collected as a class activity each individual student must develop their own outcome to manage and present the data.

In this assessment activity, students will:

* develop a means to gather and structure their data in such a way that it will allow the data to be effectively entered into a database application (e.g. online forms/sheets, paper form and a stand-alone database application or any other online web based tools).
* develop a structured database to store, query and organise the data that they have gathered from their chosen context (for the purpose of this assessment, the database may be flat file).
* present the information from their database effectively, this could be in the form of graphs.

An example could be gathering data to use from <http://data.ecan.govt.nz/Catalogue/Method?MethodId=98>

This is an extract of a dataset from a monitoring station in St Albans in Christchurch presented in comma delimited form. Students will be required to structure their own data.

example data

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| DateTime,StationName,CO (mg/m3),NO2 (ug/m3),NOx (ppb),PM10 (ug/m3),PM2.5 (ug/m3),PMCoarse (ug/m3),Relative humidity (%),Temperature (near ground - top of mast) (DegC),Temperature 10m (DegC),Temperature 2m (DegC),Wind maximum (m/s),Wind speed (m/s)2019-06-01,St Albans,0.354879349470139,15.7742910385132,13.4651327133179,14.1038541793823,8.67333316802979,5.43052053451538,90.6372528076172,0.032423734664917,9.91655158996582,9.94897556304932,2.42499995231628,1.32716655731201 |

Students could investigate the number of poor air quality nights in New Zealand by using the PM10 (ug/m3) data from this dataset.

PM10 (particles with a diameter less than 10 micrometres) is the major air pollutant monitored in New Zealand. Exposure to particulate matter can contribute to heart and lung diseases, and can lead to hospitalisations and premature death.

<http://www.ehinz.ac.nz/indicators/air-quality/particulate-matter/>

What students will need to understand is what data is recorded, what it means, and how it is being used.

**Conditions/Ngā Tikanga**

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

The 4 credits for the achievement standard(s) 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. Students should have a minimum of three specific checkpoints with their teacher as they work through this assessment task. For example, one at the end of the initial proposal, one when they have developed their database, and one when they have developed their design.

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: newspaper extracts, and/or notes from textbooks.

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**Student/Ākonga instructions**

**Introduction/Kupu Arataki**

This assessment activity requires you to identify and investigate a dataset around an issue.

You need to develop a refined database relating to the issue.

You are going to be assessed on how effective your database is to manage and present data.

Teacher note: Insert due dates and timeframes

**Task/Hei Mahi**

1. Choose one or more context(s) related to the datasets that you will focus on for this assessment. Some suggestions are given below. You can choose your own but will need to check your choice with your teacher.
* urban water quality
* air pollution
* water quality for particular beaches
* dog control statistics
* election night data
* music, movies, social media, gameplay.
1. Think of the information that people (end users)would want to extract from your data.
2. Gather data that will related to your context – you will need to decide:
* what data you want to use
* how you will gather appropriate data.

You should identify the implication, say what it means and what this might mean for your outcome. For example, you could:

* Describe what ethics is. Describe the ethical issues that relate to your outcome. What might you need to include in your outcome to ensure this is addressed?
* Describe what aesthetics is. Describe the aesthetic elements that relate 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?

You will need to consider addressing these implications during the design, development and testing of your outcome.

1. Develop a database to structure, organise, query and present data related to your chosen question(s). The structure of the database needs to allow you to import, organise and query the data.
2. Populate the database with enough data to allow you to present the data effectively.
3. Generate meaningful information from your data through the effective use of queries, sorts, filters and/or summary calculations, and/or the charting/graphing tool.
* Apply data integrity and testing procedures to ensure your data has been stored correctly and that your queries, sorts, filters or calculations are producing accurate results.
* For organising and structuring, data fields are created, appropriate field sizes, specific data types and calculations.
* Data is entered and tested and checked against against the database fields. For example, list box, combo box for repetitive data.

You should be testing the data against the outcome and evidencing what improvements you have made.

You must include evidence of improvement through repeated cycles of trialling and improving during the design, development and testing process. You could consider some of the following:

* Trialling and improving - efficiently entering data
* Testing and improving - desk checks to make sure that the filters and calculations work as expected.
* Testing and improving against expected outcomes to make sure that data is valid.
* Trialling and improving table structures
* Trialling and improving queries
* Trialling and improving various layouts for text and images in input and output forms
* Trialling and improving the functionally of input and output forms

Provide evidence of how you addressed the relevant implications that you identified and described in the process of developing the outcome. For example:

* How have you addressed ethical or intellectual property issues?
* How have you ensured that your outcome is usable and functional for your end users?
* How have you ensured that your aesthetic elements are appropriate for your end users and have enhanced usability?
1. Submit your database and any relevant planning and notes.

You are going to be assessed on how well you:

* gather, structure, organise, query and present data for a purpose and end user
* apply an iterative process through the development and testing phases of your outcome to improve the quality and functionality of your outcome
* describe and address relevant implications
* ensure the presented data is fit for purpose and meets end-user requirements.

**Assessment schedule/Mahere Aromatawai: Digital Technologies & Hangarau Matihiko** **91879 – Data works**

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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 digital outcome to manage data.The student has created a database to store and organise the data related to their selected context. They have:* used appropriate tools and techniques to structure, organise, query and present data for an audience
* named fields appropriately
* used appropriate data types and data formatting
* created at least one query which demonstrates selection of a subset of the table data
* performed a sort or filter of the data
* summarised the data (through queries, formulae, functions or graphs/charts) for use
* effectively presented a summary of the data collected
* applied appropriate data integrity and testing procedures.

The student has checked that:* the information has been imported correctly into the database and there are no duplicate or blank records
* filters and queries display expected results
* summary calculations produce the correct results
* the graph/chart displays the information clearly and accurately.

The student has:* described implications that are relevant to the outcome
* Privacy - Privacy Act controls how 'agencies' collect, use, disclose, store and give access to 'personal information'. That personal information is not used where not needed or relates to the data.
* Usability is about how easily the end user can accomplish tasks. That the data is entered in such a way that it is able to be queried and reports created quickly and easily.

*The examples above are indicative samples only* | Develop an informed digital outcome to manage data.The student has:* ensured that the database is stored securely in their network/cloud drive and that personal data in the database is not accessible to others
* addressed any implications
* ensured that data displayed is correct and valid, i.e. any formulae used has been checked to make sure it is valid, there has been a desk check of the data and it is displaying correct in the queries
* used only imagery/visuals that they have created themselves or those from the open-clip art library to respect intellectual property
* developed their outcome to display the data in modern and crisp fonts to appeal to their target audience. The large font size and limited amount of text was applied to ensure readability and visual impact of the information.

*The examples above are indicative samples only* | Develop a refined digital outcome to manage data.The student has:* shown iterative improvement throughout the development and testing process
* created a sample dataset gathering and testing the queries and filters before importing a larger dataset
* made iterative changes to their database formatting and queries as they have developed their outcome
* tested different versions of their method of data presentation to determine which one has the most effective and meaningful presentation of the data
* presented the data effectively for the purpose and audience
* ensured that the data was being collected in such a way that it was able to be effectively analysed and summarised (e.g. multi-choice, drop down lists, check boxes).

The student has checked that:* there are no grammatical or typographical errors
* the imagery/visuals are not pixelated and accurately represent the data
* the layout demonstrates effective application of design principles.

*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. Achievement standard 91879 is derived from both *The New Zealand Curriculum* and *Te* *Marautanga o Aotearoa.* [↑](#footnote-ref-1)