

**Internal Assessment Resource**

**Digital Technologies & Hangarau Matihiko Level 2**

This resource supports assessment against Achievement Standard 918921

**Standard title:** Use advanced techniques to develop a database

**Credits:** 4

**Resource title:** Get it sorted

**Resource reference:** Digital Technologies & Hangarau Matihiko 2.3B

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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 | December 2018 Version 1  To support internal assessment from 2019 |
| 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. |

Achievement Standard 91892 is derived from both *The New Zealand Curriculum* and *Te* *Marautanga o Aotearoa.*

**Internal Assessment Resource**

**Achievement Standard:** 91892

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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**

What can we do to improve the accessibility of the selection and retrieval of data? This assessment activity requires students to use advanced techniques to develop a range of refined database systems that allow a user to select and retrieve data. Possible student projects may include:

* Home Bookshelf database
* Home DVD/CD/Vinyl Music database
* Game Console database
* Duke of Edinburgh skills/activities requirements for the Teacher in Charge
* School service hours for graduation requirements
* Student community service awards, to track number of hours to meet the targets
* Sports practices and coaching, regular attendance tracker
* Passport for participation, service and work ethic as part of school awards scheme
* Dispositional tracking for schools values.

Teachers should ensure the rigour of the outcome is appropriate for Level 7 of the NZ Curriculum. The specifications need to be agreed to prior to the design of database schema. They may be teacher-given or developed in negotiation with the student.

This assessment task asks students to develop a database using SQL and PHP. The task also expects students to present the data effectively for the purpose and end users by outputting to HTML and then applying styling techniques. This assessment can be combined with other standards, for example:

* *Use advanced techniques to develop a digital media outcome* AS91893 (if the students were to further develop the data within a website)
* *Use advanced processes to develop a digital technologies outcome* AS91897 (if students were to use an advanced process to plan and develop their database).

**Conditions/Ngā Tikanga**

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**

This assessment has been intended to be developed within a MySQL/PHP environment. Students will need:

* Read/Write access to folders sitting on an IIS or Apache2 type server
* HTTP access to a server which includes PHP modules

A database admin tool such as phpmyadmin or MySQL Workbench.

**Internal Assessment Resource**

**Achievement standard:** 2.3

**Standard title:**  Use advanced techniques to develop a database

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**Student/Akonga instructions**

**Introduction/Kupu Arataki**

The assessment activity requires you to develop a database that allows a user to select and retrieve data. You are going to be assessed on how well you design and develop your database.

You may work with others to help generate ideas and develop those ideas. However, you will be expected to show your own thinking and evidence of how you discussed and combined ideas together to write and submit your own work.

Teacher note: Insert due dates and timeframes

**Task/Hei Mahi**

You are going to design and create a database to allow users to store and access information.

Possible ideas include:

* Home bookshelf database
* Home DVD/CD/Vinyl music database
* Console Games database
* Home inventory
* Duke of Edinburgh skills/activities requirements for the teacher in charge
* School service hours for graduation requirements
* Student community service awards, to track number of hours to meet the targets
* Sports practices and coaching, regular attendance tracker
* Passport for participation, service and work ethic as part of school awards scheme
* Dispositional tracking for school values.

Advanced techniques that you could use in creating the database include:

* linking data in related tables or nodes using queries or keys
* writing custom queries to filter and/or sort data
* using logical, mathematical and/or wildcard operators
* customising presentation of the data
* using custom forms to add user input to the database
* setting validation rules for data entry.

1. Decide on your idea.
2. Plan, design and create a database/web outcome that improves accessibility through the selection and retrieval of data.
3. Your outcomes must allow for the following specifications:

Teacher note: Teacher should provide end user specification/requirements

**Database specifications**

* MySQL database with two related tables

**Website specifications**

* Select items by category
* Sort items by an appropriate method (A-Z, date)
* Calculate and display appropriate results using database query.

**Database Design and Testing:**

Include a description of two related tables and datatypes used. You also need to indicate what data might be expected. For example, the value of an item cannot be a negative number. Perform early testing using expected SQL queries, recording the query and all results.

**Webpage Output**

Construct PHP code that connects to the database, queries the database and outputs the results to a webpage. Perform tests to make sure database queries perform as expected.

**Webpage Styling**

Use HTML elements and CSS to enable user selection/sorting of data to present your data in a readable manner.

**Implications**

Explain the implications associated with your outcome. This could include

* + why it needs to be socially/culturally acceptable
  + why it needs to honour legal, ethical and intellectual property obligations
  + why it needs to be accessible, usable and functional
  + why it needs to be sustainable and future proof

**Testing**

Make sure that your queries are accurate and produce the correct response. You should do a desk check and you should test the queries individually in the database admin tool that you are using. This should be carried out on all queries.

**Improvement of the database**

You should improve the database through feedback and cycles of trialling and testing iteratively throughout the design, development and testing process to improve the quality of the database.

Submit evidence of how you have used advanced techniques to develop a database.

The evidence could be in the form of a document that includes screenshots showing the development of the outcome including evidence of designing, developing and testing. This should not be any longer than 5 A4 pages. This could also take the form of a narrated or subtitled video or screen capture.

You should submit evidence of:

* planning and design of the database
* the use of appropriate tools and advanced techniques to structure, organise, and query data logically
* printouts of the tables that you have created
* the correct data being displayed on the outcome
* showing the data you tested to ensure functionality
* presentation of the outcome
* iterative improvement throughout the design, development and testing process
* presenting data effectively for the purpose and end users
* addressing the relevant implications.

**Assessment schedule/Mahere Aromatawai: Digital Technologies & Hangarau Matihiko 91892 – Get it sorted**

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| **Evidence/Judgements for Achievement/Paetae** | **Evidence/Judgements for Achievement with Merit/Kaiaka** | **Evidence/Judgements for Achievement with Excellence/Kairangi** |
| Use advanced techniques to develop a database.  The student has:   * designed the structure of the database * used appropriate tools and advanced techniques to organise, query and present data for a purpose and end users   **For example (partial evidence)**  They have:   * a database plan showing the data structure, including the tables that will be used and how the data in the tables will be linked * named fields appropriately * used appropriate data types and data formatting * written a custom query to filter and/or sort data * used mathematical and/or wildcard operators.   The student has:   * applied appropriate data integrity and testing procedures   **For example (partial evidence)**  Evidence of comprehensive testing has been supplied showing that adding material to the database works correctly and that the various queries return the expected results.  The student has:   * explained the relevant implications   **For example (partial evidence)**  They have explained:   * why copyright/IP needs to be honoured * why the database/website needs to be easy to use * why the information needs to be accessible.   *The examples above are indicative samples only* | Use advanced techniques to develop an informed database.  The student has:   * used information from testing procedures to improve the quality of the database * structured, organised and queried the data logically   **For example (partial evidence):**  The student has asked a volunteer to test the database and has made improvements/changes based on this testing. Tests were made to ensure that:   * it is easy to use * the display of the output is in a logical order that is easy to read and understand * the queries make it easy to filter and extract required data from the database.   The student has:   * addressed relevant implications in the outcome   **For example (partial evidence):**  Any images that are used in the outcome are cited in the supporting documentation and are either original artwork or creative commons/public domain images.  The information is accessible (e.g. images have alt tags and student has checked that site is readable for colour blind users).  *The examples above are indicative samples only* | Use advanced techniques to develop a refined database.  The student has:   * evidence of iterative improvement throughout the design, development and testing process   **For example (partial evidence):**  They changed data types of some of their fields to ensure all data was using an accurate data type.  They ran a series of test queries and corrected the table structure to ensure the queries could link data from more than one table, including:   * testing of potential SQL queries that include SELECT and JOIN statements * testing of PHP output when using connection and queries.   The student carried out usability tests at key points during the creation of the database to ensure that it was fit for purpose and easy to use. They used information from testing at each point to improve and refine the outcome. For instance, they checked that:   * the input form was easy to use and that the error messages were visible and easy to understand * query results were easy to understand * searching was easy for users (e.g. users could easily run the queries based on the structure of the data).   The student has:   * presented data effectively for the purpose and end-users   **For example (partial evidence):**  There are no grammatical or typographical errors. The layout demonstrates effective application of design principles.  The selection/sorting features of the webpage are obvious.  The web indicated the current selection/sort being performed by the user.  *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