

**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:** Cool Collections

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

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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 1To 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 91862 is derived from both *The New Zealand Curriculum* and *Te* *Marautanga o Aotearoa.*

**Internal Assessment Resource**

**Achievement Standard:** 91892

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

**Credits:** 4

**Resource title:** Cool Collections

**Resource reference:** Digital Technologies & Hangarau Matihiko2.3A

**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**

The assessment activity requires students to use advanced techniques to develop a refined database to organise a collection of objects. The collection could involve magical fantasy cards, sporting cards, baseball cards, online badges or anything that can be grouped and catalogued.

Teachers are encouraged to edit this task to make it suitable for their students and community.

**Conditions/Ngā Tikanga**

It is recommended that students should have at least two identified checkpoints with their teacher as they work through this assessment activity to ensure they have an opportunity to ask questions and gather feedback.

The format of the final outcome is a database/web solution where new items in the collection can be added to the database via a web form and the database can be searched (i.e. queried) via a web page.

In addition to the web/database outcome, students will need to supply evidence of planning and testing the outcome (see student task for more details).

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 a database hosting environment (e.g. XAMPP and local host).

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**Student/Akonga instructions**

**Introduction/Kupu Arataki**

This assessment activity requires you to design and create a database.

You are going to be assessed on how successfully you use advanced techniques to design, implement and refine your database.

Teacher note: Insert due dates and timeframes. Edit Appendix A to suit your community. Ensure that you have several different data-types where students can write suitable queries. Fields should include text, numbers and possibly a date/time field and/or a calculation.

**Task/Hei Mahi**

You are going to design and create a database to store the contents of a collection of objects or badges such as a gaming inventory, sports card collection, music collection etc.

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.

In this assessment resource, find an open source dataset of sports or fantasy trading cards. Please see Appendix A for sample test data.

Your database must:

* allow users to add items to the collection.
Information on your chosen Trading Cards can be found at https://www.kaggle.com/datasets
* ensure that users can’t add obviously incorrect data, allow users to query the collection and display information that allows them to make decisions for a battle or trading. Examples of the types of queries and results displayed are:
* Which cards would be best to use to fight against another?
* Find friends who own three or more cards?
* Find all the cards of a certain type, sorted alphabetically by name then owner?
* Find all cards with a Market Value greater than $10.00 with hit points over 65, sorted by the greatest Market Value to the lowest?
* Find all the Legendary Cards?
* Search for cards based on who owns them and provide the total value of their cards?
* Create any other queries that you think would be useful to future users, for example:
	+ specific Types/Powers (by name/part of a name)
	+ hit points
	+ legendary or not
	+ category (where results are sorted alphabetically)
	+ generation of item
	+ value of item (where value can be more than/less than or equal to a given amount)

You also need to provide documentation showing:

**Database planning**

Design the structure of the database including a description of the tables and datatypes used. You will need to show how the data in your tables can be linked, so that you can query data from more than one table. You also need to indicate what data might be expected. For example, the value of an item can’t be a negative number and currency should be in dollars.

* Explain the relevant implications. This could include why your outcome:
	+ - needs to be socially/culturally acceptable
		- needs to honour legal, ethical and intellectual property and/or privacy obligations
		- needs to be accessible, usable and functional
		- needs to meet end-user considerations
		- needs to be sustainable and future proof

Show how you have addressed the relevant implications

**Testing**

* A screen capture showing that the data entry form works for expected input.
* A screen capture showing the error messages that appear when users attempt to enter invalid data.
* Screen captures showing that the various queries work as expected.
* Screen captures to show how the outcome was tested with end user/s to confirm it meets the purpose and end user considerations.

**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.
* Evidence of the correct data being displayed on the outcome.
* You must show the data you tested to ensure functionality.
* Iterative improvement throughout the design, development and testing process.
* Presenting data effectively for the purpose and end users.
* Addressing the relevant implications.

Note: Testing can be done by making a brief screencast showing the outcome being comprehensively tested. If desired, you can take screen captures of your screencast and annotate them. This is often easier than trying to screen capture whilst testing where it is easy to ‘forget’ to screen capture a key part of the test. If you prefer, you are welcome to talk us through your testing and simply submit a brief screencast (screencasts should be 3 minutes or less in length).

**Appendix A – Default Task**

You have recorded a Trading Card collection for your friends. Each entry shows your friend’s name, the name of the card and associated data. For example: their powers (Type 1 & 2) the HP, Attack points, Defence points, Special Attack points (Sp. Atk), Special Defence points (Sp. Def), Speed, the Generation, if it is Legendary, and the Market Value.

**Trading Card** **Glossary:**

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| HP | Hit Points |
| Generation | To date, there are seven generations, each introducing their own qualities and characteristics to the game. |
| Legendary | Can the character make more of itself (True = Yes, False = No). Legendary characters (True) are considered to be quite rare.  |
| Speed | The higher the speed, the more likely it is for its moves to hit and the more likely it is to evade attacks.  |
| Sp Atk | Indicates how much damage is caused when using a special move. |
| Sp Defence | Determines how much damage is received when it is hit with a special move. |
| Type | All characters and their moves are assigned certain types. Each type has several strengths and weaknesses in both attack and defence.  |

The following is a sample Dataset.

Below is a list of Generic Trading Cards with information on each fantasy character

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| **Student Name** | **Character Name** | **Type 1** | **Type 2** | **HP** | **Attack** | **Defense** | **Sp. Atk** | **Sp. Def** | **Speed** | **Generation** | **Legendary** | **Market Value** |
| Brandon Dean | Luasaurus | Psychic |  | 50 | 95 | 90 | 95 | 90 | 180 | 3 | TRUE | $24.98 |
| Brandon Dean | Task Monster | Bug | Flying | 61 | 90 | 45 | 50 | 50 | 160 | 3 | FALSE | $6.99 |
| Frank McDonald | Roofus | Psychic |  | 55 | 50 | 65 | 175 | 95 | 150 | 1 | FALSE | $5.60 |
| Frank McDonald | Johnzilla | Rock | Flying | 80 | 135 | 85 | 70 | 95 | 150 | 1 | FALSE | $4.89 |
| Tamati Howell | Julieanoos | Psychic |  | 50 | 150 | 50 | 150 | 50 | 150 | 3 | TRUE | $36.93 |
| Rameesh Akhmil | Crisstopolus  | Psychic |  | 50 | 180 | 20 | 180 | 20 | 150 | 3 | TRUE | $28.00 |
| Frank McDonald | Fernman  | Bug | Poison | 65 | 150 | 40 | 15 | 80 | 145 | 1 | FALSE | $10.00 |
| Frank McDonald | Stevador | Grass | Dragon | 70 | 110 | 75 | 145 | 85 | 145 | 3 | FALSE | $5.89 |
| Debra Horo | Amazona | Bug |  | 80 | 70 | 40 | 100 | 60 | 145 | 5 | FALSE | $5.37 |
| Debra Horo | Markus The Great | Electric |  | 60 | 50 | 70 | 80 | 80 | 140 | 1 | FALSE | $5.80 |
| Brandon Dean | Caoimhe | Psychic |  | 106 | 150 | 70 | 194 | 120 | 140 | 1 | TRUE | $20.00 |
| Brenda Lawson | Iarlaith The Brave | Electric |  | 70 | 75 | 80 | 135 | 80 | 135 | 3 | FALSE | $3.98 |
| Tamati Howell | TruthSayer | Normal | Fighting | 65 | 136 | 94 | 54 | 96 | 135 | 4 | FALSE | $4.60 |
| Brandon Dean | GunSlayer | Ghost | Poison | 60 | 65 | 80 | 170 | 95 | 130 | 1 | FALSE | $6.55 |
| Tamati Howell | Doorfool | Electric |  | 65 | 65 | 60 | 110 | 95 | 130 | 1 | FALSE | $7.60 |
| Brandon Dean | Miaminx | Rock | Flying | 80 | 105 | 65 | 60 | 75 | 130 | 1 | FALSE | $4.90 |
| Debra Horo | Isadora | Psychic |  | 106 | 110 | 90 | 154 | 90 | 130 | 1 | TRUE | $28.55 |
| Rameesh Akhmil | Noinin | Psychic | Fighting | 106 | 190 | 100 | 154 | 100 | 130 | 1 | TRUE | $23.40 |
| Tamati Howell | MadHatter | Poison | Flying | 85 | 90 | 80 | 70 | 80 | 130 | 2 | FALSE | $9.45 |
| Tamati Howell | Super K | Normal | Fighting | 100 | 128 | 90 | 77 | 77 | 128 | 5 | FALSE | $5.97 |
| Debra Horo | WhiteBeard | Grass | Flying | 100 | 103 | 75 | 120 | 75 | 127 | 4 | TRUE | $36.78 |
| Rameesh Akhmil | Big Rangi | Fire | Flying | 78 | 81 | 71 | 74 | 69 | 126 | 6 | FALSE | $8.99 |
| Rameesh Akhmil | Captain Moemoe | Normal | Flying | 60 | 85 | 60 | 50 | 50 | 125 | 3 | FALSE | $4.78 |
| Debra Horo | Tiger Hana | Dark | Ice | 70 | 120 | 65 | 45 | 85 | 125 | 4 | FALSE | $15.00 |
| Tārere Ruakere  | Butler | Dark |  | 70 | 90 | 90 | 135 | 90 | 125 | 4 | TRUE | $38.60 |
| Rameesh Akhmil | Bird Brain | Flying | Dragon | 85 | 70 | 80 | 97 | 80 | 123 | 6 | FALSE | $4.70 |
| Brandon Dean | TaniwhaX  | Water | Dark | 72 | 95 | 67 | 103 | 71 | 122 | 6 | FALSE | $5.98 |
| Rameesh Akhmil | Moasaur | Normal | Flying | 83 | 80 | 80 | 135 | 80 | 121 | 1 | FALSE | $4.78 |
| Brandon Dean | Maximuss | Flying |  | 79 | 100 | 80 | 110 | 90 | 121 | 5 | TRUE | $33.55 |

**Assessment schedule/Mahere Aromatawai: Digital Technologies & Hangarau Matihiko 91892 – Cool Collections**

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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 user

**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
* created a form which allows users to add data to the database.

The student has:* applied appropriate data integrity and testing procedures

**For example (partial evidence)**Data is validated before it is added to the database to prevent obviously invalid material from being inserted (e.g. blank records).Evidence of 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 needs to be easy to use
* why the database needs to be secure

*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):**They have tested the information to ensure it is accessible, easy to use and functions as intended. They have included links/references to any copyrighted trading card material. *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. 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 the data effectively for the purpose and end-user

**For example (partial evidence):**They 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). There are no grammatical or typographical errors. The layout demonstrates effective application of design principles. They have made customised presentation displays for various queries to better display the data.*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