DIGITAL TECHNOLOGIES HUB

Australian Curriculum V9.0

Acquiring, analysing and visualising data

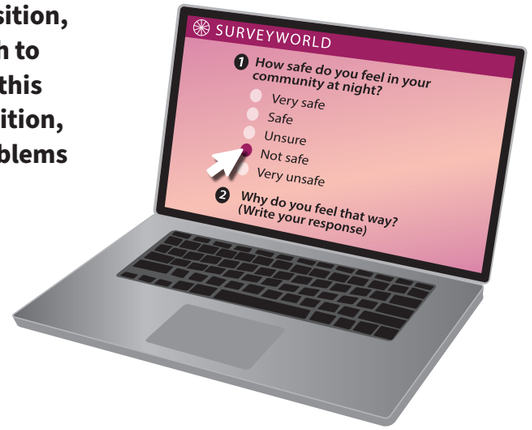
Explore the properties of data, how it is acquired and interpreted using a range of digital systems and peripherals, and analyse data when creating information.

ACARA, 2022

Years 9–10

I can acquire data and apply spreadsheet formulas, functions and techniques to clean and analyse data and also use structured query language (SQL) to query data in databases.

The data science process involves stages of data acquisition, cleaning and analysis, providing a structured approach to extracting insights from raw data. Students can apply this process to real-world scenarios, practising data acquisition, cleaning, and analysis to derive insights and solve problems systematically.



Use a topical context such as internet scams for students to investigate. Acquire data though online surveys or face-to-face interviews following privacy rules. Discuss data collection techniques such as Likert scale ratings or open-ended responses.

A spreadsheet can be used to clean, analyse and visualise data. Students build on skills developed in previous years to apply more advanced features and functions such as pivot tables. They explore how charts and other visualisations can be made interactive, for example by allowing buttons and dropdowns to select a different series of data.

Respondent ID	Age group	Scam type	Impact level
1	18–25	Phishing	3
2	26–35	Online shopping	4
3	36–45	Phishing	2
4	18–25	Tech support	5
5	46–55	Social media	1
6	56+	Other	3

Organise data in a spreadsheet, then clean data, for example, convert text responses into themes and handle missing values making it ready for analysis. Create interactive elements such as a pivot table, summarise the data to show the average impact level of each scam type across different age groups.

An artificial intelligence (AI) recommender system is a type of information filtering system that attempts to predict the rating or preference a user would give to an item.

Investigate recommender systems and the data the AI system uses to predict content relevant to a user. Create a visual representation of a familiar recommender system to demonstrate data flow, including inputs and outputs.

Relational databases allow data to be structured in a complex and organised way. By understanding the relationships between tables within a database, students can create queries (including with SQL) to retrieve only data that is relevant to their needs. This output can be exported to a spreadsheet for further analysis.

Provide access to a structured multi-table database, for example, an IMDB database of movies with viewer rating. Model and investigate how to use a query to answer a question such as: What are the most popular movies?

```
SELECT [IMDB Movie Data].
Movie_Name,
[IMDB Movie Data].Genre,
[IMDB Movie Data].Year,
[IMDB Movie Data].Rating,
[IMDB Movie Data].Metascore
FROM [IMDB Movie Data]
ORDER BY [IMDB Movie Data].
Rating;
```

All Access Obj... | Search... | Tables: IMDB Movie Data | Queries: Query1, Query2

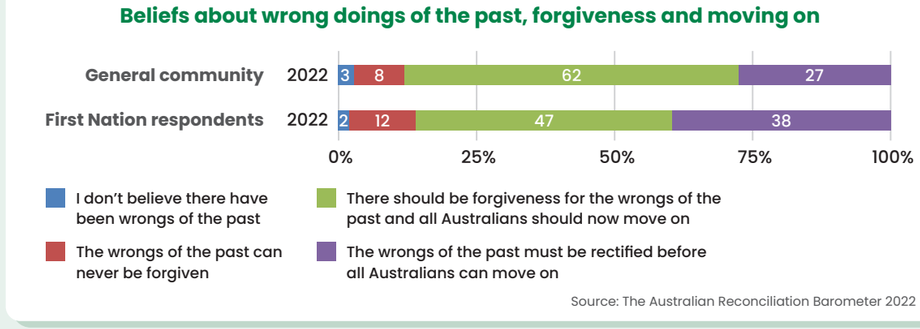
Query1

Movie_Name	Genre	Year	Director	Actors	Rating	Metascore
Mad Max: Fury Road	Action,Adventure,Sci-Fi	2015	George Miller	Tom Hardy,Cha	8.1	90
The Bourne Ultimatum	Action,Mystery,Thriller	2007	Paul Greengrass	Matt Damon,E	8.1	85
Looper	Action,Crime,Drama	2012	Rian Johnson	Joseph Gordon	7.4	84
Snowpiercer	Action,Drama,Sci-Fi	2013	Bong Joon Ho	Chris Evans,Jam	7	84
Avatar	Action,Adventure,Fantasy	2009	James Cameron	Sam Worthingt	7.8	83
The Lego Movie	Animation,Action,Adventure	2014	Phil Lord	Chris Pratt,Will	7.8	83

Achievement standard	Students acquire, interpret and model complex data with databases and represent documents as content, structure and presentation.
Content descriptions	Develop techniques to acquire, store and validate data from a range of sources using software, including spreadsheets and databases | Digital Technologies AC9TDI10P01 Analyse and visualise data interactively using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends and outliers | Digital Technologies AC9TDI10P02 Model and query entities and their relationships using structured data | Digital Technologies AC9TDI10P03

Related content

Posing statistical questions, collecting, representing and interpreting data from different sources in relation to reconciliation, considering the relationships between variables.



Mathematics	Students plan and conduct statistical investigations involving the collection and analysis of different kinds of data; report findings and discuss the strength of evidence to support any conclusions | Mathematics AC9M9ST05