

Years 7–8

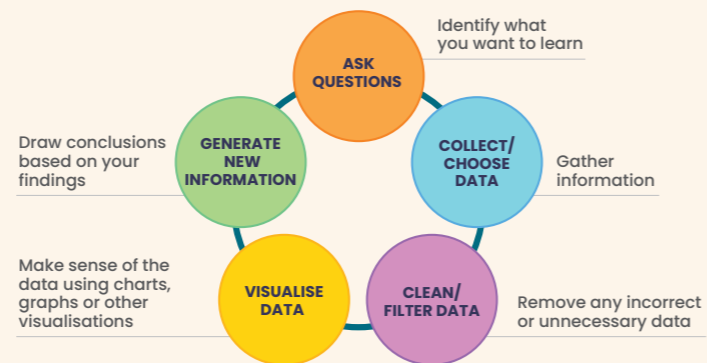
I can acquire data, organise and analyse it using a spreadsheet to answer an inquiry question, and also use a database to answer a specific query.

Data can be acquired from various sources, including paper and digital surveys, electronic sensors, fitness tracking apps and online data repositories. This data can be used to answer an inquiry question.

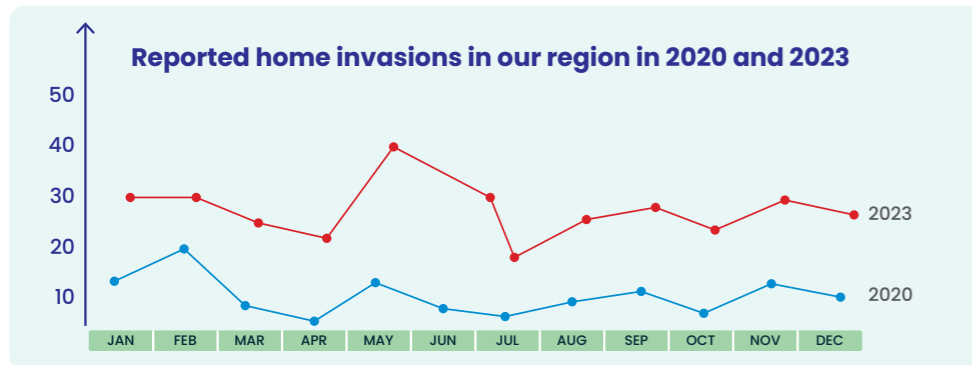
Following a data analysis cycle such as this approach from *Code.org* can provide students guidance with the multi-step process.

Students start the process by acquiring data to answer questions that are of interest and relevant for their own investigations. For example: Is our community a safe place? Are the foods we eat healthy and nutritious? Are all sports inclusive?

Data analysis cycle



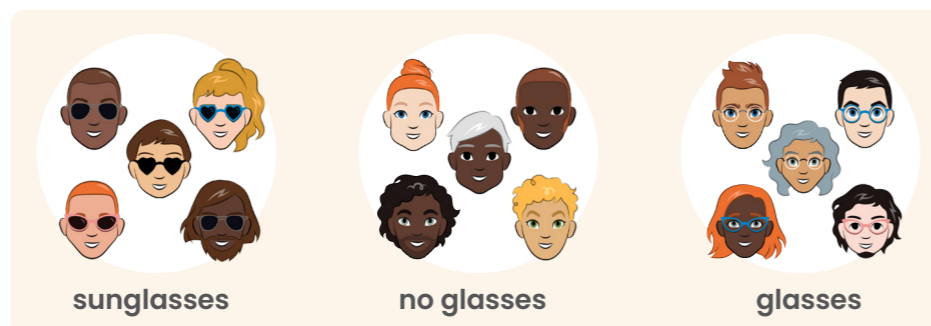
Spreadsheets are useful digital tools for organising, analysing and visualising data. Apply spreadsheet skills such as filtering and sorting, using formulas and creating charts. Summarise data to identify trends, make predictions and draw conclusions.



Sort crime data to filter by offence, region and date to identify trends over time. Create charts to visualise the data and support conclusions.

Artificial intelligence (AI) classification systems are trained on vast amounts of data using a process called supervised learning. The AI learns to classify or predict outcomes based on labelled training data. There is potential for these systems to include bias that may unintentionally cause harm to certain groups, for example, a group under represented in the training data may result in unfair outcomes.

Use *Teachable Machine* to practise training and testing an AI model using cartoon faces, some of which have sunglasses. Discuss how the AI system interprets data, sources of potential algorithmic bias, and their impacts.



Databases provide a more complex and organised way to structure data compared to typical spreadsheets. Data in databases is grouped as attributes within records. Students learn to make queries to select data that meets specific criteria, for example, using structured query language (SQL).

The school library database can be used to introduce simple SQL queries. Use a basic query such as: 'SELECT * FROM Books;' to retrieve all books in the library. Filter with WHERE clause to find all books written by a specific author, for example, SELECT * FROM Books WHERE author = 'J.K. Rowling'; Use ORDER BY clauses, to order by year of publication.

Column name	Data type	Description
'book_id'	INT	Unique identifier for each book
'title'	VARCHAR	Title of the book
'author'	VARCHAR	Author of the book
'genre'	VARCHAR	Genre of the book
'year'	INT	Year the book was published
'available'	BOOLEAN	Availability status (TRUE/FALSE)

Achievement standard

Students acquire, interpret and model with spreadsheets and represent data with integers and binary.

Content descriptions

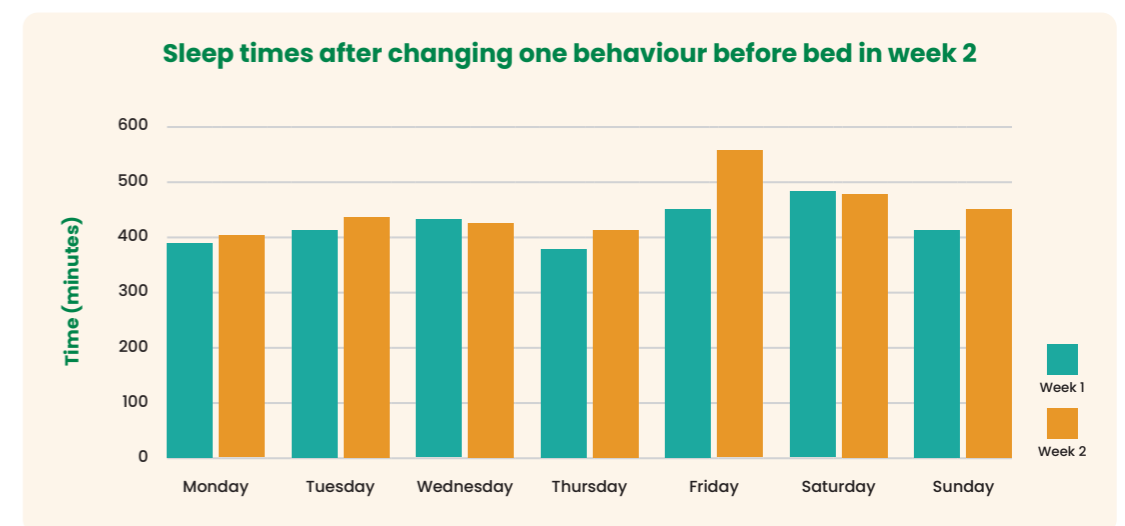
Acquire, store and validate data from a range of sources using software, including spreadsheets and databases | Digital Technologies AC9TDI8P01

Analyse and visualise data using a range of software, including spreadsheets and databases, to draw conclusions and make predictions by identifying trends | Digital Technologies AC9TDI8P02

Model and query the attributes of objects and events using structured data | Digital Technologies AC9TDI8P02

Related content

Statistically analyse sleep related data to make informed decisions on daily habits, promoting healthier lifestyles.



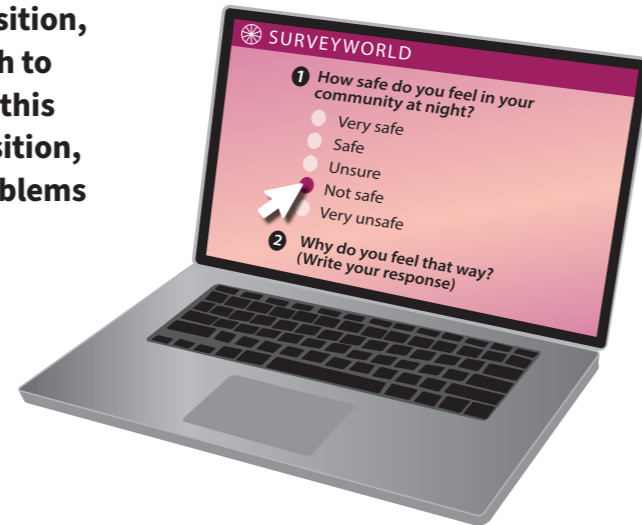
Mathematics

Students plan and conduct statistical investigations involving data for discrete and continuous numerical variables; analyse and interpret distributions of data and report findings in terms of shape and summary statistics | Mathematics AC9M7ST03

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 through 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;
```

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.

Beliefs about wrong doings of the past, forgiveness and moving on



Source: The Australian Reconciliation Barometer 2022

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