Identifying opportunities to build data literacy in Years 7–10 Health and Physical Education

P–10 Australian Curriculum

Key messages

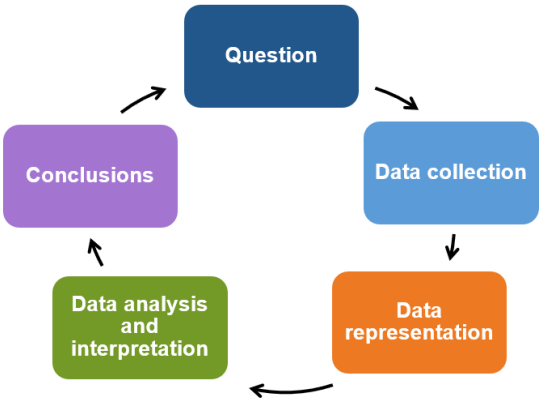
'Data is increasingly important, as will be those able to interpret, explain and communicate the meaning lying behind that data in ways everyone can understand' (Deakin University 2019).

This factsheet focuses on:

- the data collection and analysis cycle
- data literacy opportunities within the Australian Curriculum: Health and Physical Education
- key teaching and learning strategies for engaging students in data literacy.

Data collection and analysis cycle

The data collection and analysis cycle is adapted from Siemon et al. (2015) and may be used during any type of systematic investigation.



The complete data collection and analysis cycle begins with developing a question of interest for exploration. Students then collect data in the form of observations and/or measurements to attempt to answer the question posed. This data is then represented in a form that allows analysis and interpretation, e.g. visualising and looking for patterns in data. Students may draw conclusions to attempt to answer the original question and/or raise further questions for subsequent investigation.

Students may be involved in the complete cycle or with select aspects as they engage in a unit of work involving data.

Data literacy opportunities — Australian Curriculum: Health and Physical Education

An achievement standard states what students should know and be able to do at the end of a specific year. The standards provide explicit opportunities for students to employ their data literacy understanding and skills.

In Years 7–10 Health and Physical Education there are opportunities for students to:

- focus on data collection techniques
- effectively represent that data
- describe and interpret data.

For example, in Years 9–10 students can investigate the role of food and nutrition in enhancing health and wellbeing. This provides many opportunities for students to read and interpret tables and graphs associated with the recommendations for healthy eating.

Strategies for building data literacy

Two key teaching and learning strategies for engaging students in data literacy are using directed activities related to text and comparing effectiveness of representation types.

Directed activities related to text

Directed activities related to texts (DARTs) are activities designed to encourage critical analysis of representations. They may be used to get students to interact with any text, including visual text commonly used in Health and Physical Education. DARTs are employed as a strategy for enhancing understanding of conventions and improving data comprehension, e.g.

- reconstruction activities, where students complete information that has been intentionally omitted from a graphical representation (title, labels, key, frequencies) and discuss their decisions
- questioning activities, which encourage a more critical examination of the data, its source and the type of questions that could be answered by the data. Students can consider
  - Who wanted this data, and why did they want it?
  - Where was the sample drawn from?
  - How were the categories decided?

Comparing effectiveness of representation types

The Health and Physical Education learning area advice for the National Numeracy Learning Progressions suggests that students can use data to develop displays that:

- propose explanations for patterns, relationships and trends
- predict outcomes
- propose future action.

Providing teaching and learning opportunities for students to explore which display conventions are most suitable for specific sets of data is important.

The table below outlines some examples of the contexts within Health and Physical Education where particular representations are most effective.

Representation type	Graphing convention	Example
Line graph	• represents trends in continuous data — time, distance, intensity	• data representation of intensity or heart rate during physical activity • data representation of physical activity levels across age groups
Pie chart	• represents proportional data from a sample size	• data representation of the percentage of food groups within a meal plan • trends in the participation of organised sport within a sample size
Column graph	• represents frequency trends across categories or groups	• comparison of fitness levels of different age groups • data representation of healthy lifestyle indicators

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