 Predicting outcomes in sport

Driving question – How can mathematics be used to predict outcomes in sport?

This investigation has been designed to be conducted for the National Rugby League using the 2019 [draw and results](https://www.nrl.com/draw/?competition=111&season=2019&round=1). This resource could be adapted for any sporting competition in any past year.
An offline version of this resource is available for students who do not have internet access. For a copy of the offline version please contact mathematics7-12@det.nsw.edu.au.

Your investigation

The results in every sporting competition are a complex blend of factors. In the NRL this includes scoring tries and kicking goals, gaining metres, making tackles and, ultimately, scoring more points than your opponent each game. This investigation is to determine whether the ‘points scored’ over a certain number of rounds is a good indicator of where a team will finish in the competition.

Task 1 – Collecting the data

* Choose two teams in the competition and record the number of points each team scored in the first 15 – 20 rounds of the competition. You can either do this by hand or using a spreadsheet such as Microsoft Excel or Google Sheets.

Task 2 – Analysing the data

All

* For each team, organise the ‘points scored’ into a back-to-back stem-and-leaf plot to look for patterns in the spread of the scores
* For each team, calculate the measures of spread and location such as range, mode, median and mean. Again, you can either do this by hand or using a spreadsheet such as Microsoft Excel or Google Sheets.

5.2 and 5.3 only

* Calculate the five-number summary for each team and construct a box plot for the data of each team against one axis. Calculate the interquartile range.

5.3 only

* Include an analysis of the standard deviation in your calculations for the two teams.

Task 3 – Interpreting the data

* Write a brief comparison of the teams you have analysed. You should use all the data you have analysed to write the comparison. You should include similarities and differences in the calculations and what these mean in the context. You should discuss whether there are any clusters or outliers in the data. Draw a conclusion about which team appears to have the better statistics.

Task 4 – Making a decision

Find the ladder with the results for the competition and discuss whether your findings are consistent with the overall rank of the two teams. Use this answer the driving question, “How can mathematics be used to predict outcomes in sport?”

Outcomes

Stage 5.1

* uses appropriate terminology, diagrams and symbols in mathematical contexts MA5.1‑1WM
* selects and uses appropriate strategies to solve problems MA5.1‑2WM
* provides reasoning to support conclusions that are appropriate to the context MA5.1‑3WM
* uses statistical displays to compare sets of data, and evaluates statistical claims made in the media MA5.1‑12SP

Stage 5.2

* selects appropriate notations and conventions to communicate mathematical ideas and solutions MA5.2‑1WM
* constructs arguments to prove and justify results MA5.2‑3WM
* uses quartiles and box plots to compare sets of data, and evaluates sources of data MA5.2‑15SP

Stage 5.3

* generalises mathematical ideas and techniques to analyse and solve problems efficiently MA5.3‑2WM
* uses deductive reasoning in presenting arguments and formal proofs MA5.3‑3WM
* uses standard deviation to analyse data MA5.3‑18SP

All outcomes referred to in this unit come from [Mathematics K-10 Syllabus](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/learning-areas/mathematics/mathematics-k-10) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2012