Year 8 Maths Investigation

Rebuilding a State of Origin Team

Scenario:

The State of Origin is a major part of the NRL calendar and one of the most watched Australian sporting events every year with over 4 million viewers! The teams are made up of the best NRL players from NSW and QLD. Each year these two teams go head to head in a tough three game series.

Pride is at stake as both teams carry the expectations and hopes of an entire state into each series. This brutal exchange has been played since 1980 and remains an honoured tradition for all selected players.

Both teams are going through some changes this year and are striving to find that winning edge over their rival. In every new series each year, there are retirements, injuries, team commitments, player performance and coaching staff changes that impact on team that is selected to represent the respective state teams.

This is where you come in! Traditionally, selectors have picked players that have done the job for their state in the past, using loyalty as a major factor in player selection. This theory proved problematic for both teams last year, losses on the back of less than impressive player performances forced changes in both teams.

Selectors are looking for new ideas. It is time for a change, your State needs you!

Task Outline:

Based on your extensive knowledge within mathematics, select the best possible team of 17 players based on data and statistics from the last season from either QLD or NSW. Compare each of these players with the Game 3 State of Origin squad. Your opinions and preferences of players and teams must be pushed aside as your knowledge of statistics becomes the determiner of all selections in each position. Which state team will you rebuild?

Maths Investigation

Rebuilding a State of Origin Team

Investigation Question:

Can you create the statistically strongest State of Origin team?

Task:

Use data and statistics to rebuild last year's New South Wales or Queensland State of Origin Rugby League team. Your task is to create the statistically strongest team from all eligible players for their respective states.

- Players must be selected based on statistics that are important to their position they play in.
- You need to include **comparative graphs from excel**, **images and text** in your response.
- Player selection and justification: Coaches form strong opinions on certain players based on past service for their state. Evaluate their existing position in their team and let the data decide whether they deserve to keep their spot in the team or be replaced by a statistically stronger player from their state.
- Compare last year's team side with the potential new players vying for selection. Use comparative data to support your selection choices.

Tasks include:

- Task 1: Statistical Sampling
- Task 2: Player Comparison task
- Task 3: Team Selection and Justification task
- Task 4: Statistical comparison between the last year's team and your selected team
- Task 5: Mean Median, Mode and Range – Optional Task
- Task 6: Effect of Outliers on Player Statistics – Optional Task
- Student evaluation task

Task 1:

Statistical Sampling

Comparing and ranking player statistics can be a really confusing as there are over 500 players in the NRL and that is not even taking into account the rookies that have entered the competition this year.

Using a census for calculating mean, medians and the mode of data could be very time consuming. Statistical sampling on the other hand allows us to use partial amounts of the entire player population to identify trends in the data. Using only 20 data sets instead of 500 can really save us some time.

Part A:

Your task is to design and implement a method to retrieve a **statistical sample** of players in each position. Utilising this statistical sample, calculate the **mean** of the most important statistic so players can be easily identified as high performers**.** The sample needs to be at least 30 players.

The **'Important statistic'** column of **appendix 2** for each player position will identify what data will need to have statistical sampling applied to it. Once the mean is identified for each position it will be far easier to identify which players sit above the average and could be potential 'State of Origin' players.

Example:

Position	Positional Numbers	Physical characteristics	Role in Rugby League side	Important Statistics
Fullback	1	These players are usually among the tallest on the field. Most players are under 95kg as they do a lot of running	Defensively, is the last line, standing behind the rest of his teammates and utilised for returning oppositions kicks in general play. In attack, displays a good passing ability and speed. Covers all areas of the field as support player.	• Runs • Try Assists • All Run Metres

Runs made in a game is considered the most important statistic for a

Part B:

Select two players of the same position from your rugby league side and calculate the **median** of the important statistical sample for each position. Is the median for each player position higher or lower than the mean from Part A? **Formulate a statement of results**.

Part C:

Select two alternative player positions from your rugby league side and calculate the **mode** of the important statistical sample for each position. Is the mode for each player position higher or lower than the mean from Part A? **Formulate a statement of results**.

Part D:

Select two alternative player positions from your rugby league side and calculate the **range** of the important statistical sample for each position. **Formulate a statement outlining the range of the data**.