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| <b>Learning Area:</b>                            | <b>Mathematics</b>  |
| <b>Extension Certificate Title:</b>              | <b>Statistics and Probability</b>   |
| <b>Task Details:</b>                             | <p>(Please include your name and year level on the document you submit to your teacher. No group work is accepted.)</p> <p>You are to select a sport of your interest and analyse the data from last year's games. For example, you may like to look at the AFL Players individual statistics from 2020 <a href="https://afltables.com/afl/stats/2020.html">https://afltables.com/afl/stats/2020.html</a> .</p> <p>Investigate and compare the players performance and ranking based on the data you are analysing. You may like to choose suitable plots to present the data, for example stem-and-leaf plot, boxplot, histogram, scatterplot, pie graph etc. You should use at least 3 different modes of data representation.</p> <p>Write an 800-word report summarising your findings. Consider factors that may have affected the data. Use your finding to predict the top four teams who based on the data have the greatest probability of winning the championship next year.</p>   |
| <b>Victorian Curriculum Content Descriptors:</b> | <p><b>Level 9</b></p> <p>Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly from secondary sources (<a href="#">VCMSP324</a>)<br/> Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal' (<a href="#">VCMSP325</a>)<br/> Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (<a href="#">VCMSP326</a>)</p> <p><b>Level 10</b></p> <p>Use the language of 'if ...then', 'given', 'of', 'knowing that' to investigate conditional statements and identify common mistakes in interpreting such language (<a href="#">VCMSP348</a>)<br/> Determine quartiles and interquartile range and investigate the effect of individual data values, including outliers on the interquartile range (<a href="#">VCMSP349</a>)<br/> Construct and interpret box plots and use them to compare data sets (<a href="#">VCMSP350</a>)<br/> Compare shapes of box plots to corresponding histograms and dot plots and discuss the distribution of data (<a href="#">VCMSP351</a>)<br/> Use scatter plots to investigate and comment on relationships between two numerical variables (<a href="#">VCMSP352</a>)<br/> Investigate and describe bivariate numerical data, including where the independent variable is time (<a href="#">VCMSP353</a>)</p> <p><b>Level 10A</b></p> <p>Investigate reports of studies in digital media and elsewhere for information on their planning and implementation (<a href="#">VCMSP371</a>)<br/> Calculate and interpret the mean and standard deviation of data and use these to compare data sets. Investigate the effect of individual data values including outliers, on the standard deviation (<a href="#">VCMSP372</a>)<br/> Use digital technology to investigate bivariate numerical data sets. Where appropriate use a straight line to describe the relationship allowing for variation, make predictions based on this straight line and discuss limitations (<a href="#">VCMSP373</a>)</p> |
| <b>Resources Required:</b>                       | <p>Excel<br/> Internet to research data sets<br/> Numbers<br/> Graphics Calculator</p>  |
| <b>Assessment Criteria Rubric</b>                |   |

(Please note this is an 80% pass rate. If you would like to resubmit you have 7 days to do so)

| <b>Category</b>   | <b>Novice</b>  | <b>Competent</b>  | <b>Proficient</b>  | <b>Expert</b>  |
|---|--|---|--|--|
| Conceptual understanding/ use of mathematical terminology | Shows a basic understanding of most concepts.<br>Attempts to use appropriate mathematical terminology. | Shows a basic understanding of all concepts.<br>Uses appropriate mathematical terminology consistently.   | Shows a good understanding and makes links between concepts.<br>Uses mathematical terminology with precision.  | Shows original ideas and links between concepts.<br>Uses advanced mathematical terminology with precision.   |
| Data representation                                       | Some representation of the data with some analysis.  | Represent the data and provides some general analysis – though there could be more detail and accuracy in the plots.                                  | Chooses suitable plots to represent the data.<br>Analyses various data representations using some mathematical reasoning and accounting for some outliers. | Chooses a variety of suitable plots to accurately represent the data.<br>Analyses various data representations in detail using clear mathematical reasoning and accounting for outliers. |
| Development of a reasonable prediction                    | Some evidence of a sequence of thinking with a logical conclusion.                                     | Organised approach which considers most possibilities and is convincing – though there may be some doubt that all possibilities or cases are covered. | Systematic argument and prediction which convinces beyond all doubt.   | Well-reasoned thorough argument and prediction, accounting for all possibilities in the possible future outcome showing efficiency and logical reasoning.<br>Convinces beyond all doubt  |

Once this task has been submitted, your subject teacher will do an initial assessment and moderate with a Learning & Teaching Leader to ensure a fair and equitable result. The subject teacher will communicate your result to you and if you receive an 80% or above you will be awarded your Extension Certificate. If you do not reach the 80% pass rate you will have 7 days to resubmit to achieve the 80% pass rate.