VCE General Mathematics Unit 1

Sample context for assessment: Data investigation

Introduction

The task involves the investigation of numerical data across categories.

Formulation

Overview of the context or scenario, and related background, including historical or contemporary background as applicable, and the mathematisation of questions, conjectures, hypotheses, issues or problems of interest.

In this task, formulation is related to finding the summary statistics and preparing boxplots for various data sets.

Exploration

Investigation and analysis of the context or scenario with respect to the questions of interest, conjectures or hypotheses, using mathematical concepts, skills and processes, including the use of technology and application of computational thinking.

In this task, exploration is related to the comparison of two or more categories over time.

Communication

Summary, presentation and interpretation of the findings from the mathematical investigation and related applications.

In this task, communication is related to the summary of results for the data and boxplots involved, and discussion of the results comparing two or more categories over time.

Part 1

Consider the data set {6, 9, 4, 6, 7, 1, 6, 1, 4, 0, 8, 0, 1, 8, 8, 2, 8, 6, 2, 8}

1. Find the mean, median and mode of this data set and show that:  
   mean < median < mode
2. Represent the distribution of the data using a dot plot and a box and whisker plot, and comment on the shape of the distribution.

Part 2

In the following data, sets of 20 elements are to be selected with repetition from the set of digits {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} so that in each case a distribution is obtained which satisfies the given relation. In each case represent the distribution of the data using a dot plot and a box and whisker plot, and comment on the shape of the distribution.

1. mean < mode < median
2. mode < mean < median
3. mode < median < mean
4. median < mode < mean
5. median < mean < mode

Summarise how the relationship between mean, median and mode might be used to characterise symmetry or skewness in the distribution of some data.

Part 3

Investigate and prepare a brief data analysis report for a context using boxplots to compare numerical data for two or more categories over time.

Areas of study

The following content from the areas of study is addressed through this learning activity.

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| **Unit 1** | | |
| **Area of study** | **Topic** | **Content dot points** |
| Statistics | Investigating and comparing data distributions | 1, 3, 4, 5, 6 |

Outcomes

The following outcomes, key knowledge and key skills are addressed through this task.

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| **Unit 1** | | |
| **Outcome** | **Key knowledge dot point** | **Key skills dot point** |
| 1 | 1, 2, 3 | 1, 2, 3 |
| 2 | 1, 2, 3 | 1, 2, 4 |
| 3 | 2, 3, 5 | 2, 3, 4, 5, 8, 10 |