## Topic 7.1.1 Surveys and displaying data

<table>
<thead>
<tr>
<th>Strand: Statistics and Probability</th>
<th>Sub-strand: Data representation and interpretation</th>
<th>Recommended teaching time: 2 weeks (approx. 6 hours)</th>
</tr>
</thead>
</table>

### Mapping to F-10 curriculum in Victoria

#### Content descriptions

- Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169).
- Construct and compare a range of data displays including stem-and-leaf plots and dot plots (ACMSP170).

#### Achievement standard (excerpt in bold)

**Level 6**

Students interpret and compare a variety of data displays, including displays for two categorical variables. They analyse and evaluate data from secondary sources. Students compare observed and expected frequencies of events, including those where outcomes of trials are generated with the use of digital technology. They specify, list and communicate probabilities of events using simple ratios, fractions, decimals and percentages.

**Level 7**

Students identify issues involving the collection of discrete and continuous data from primary and secondary sources. They construct stem-and-leaf plots and dot plots. Students identify or calculate mean, mode, median and range for data sets, using digital technology for larger data sets. They describe the relationship between the median and mean in data displays. Students determine the sample space for simple experiments with equally likely outcomes, and assign probabilities outcomes.

**Level 8**

Students explain issues related to the collection of sample data and discuss the effect of outliers on means and medians of the data. They use various approaches, including the use of digital technology, to generate simple random samples from a population. Students model situations with Venn diagrams and two-way tables and explain the use of ‘not’, ‘and’ and ‘or’. Students choose appropriate language to describe events and experiments. They determine complementary events and calculate the sum of probabilities.

#### Activities

- Simple survey(s) involving categorical data that is nominal data, for example, eye colour, ordinal data or preferences of class members: deciding what data is required to answer specific questions, planning ways to collect, organise and display data, presentation of findings, summary statement.
- Use an online survey process tool on Scootle (e.g. Healthy Life Survey or Skateboard Survey).
- Univariate data to be presented in graphical forms by hand and through use of technology.
- Use spreadsheets or data graphers to enter data and create appropriate displays of the data (e.g. NCTM Illuminations).
- Critique categorical statistics that are presented in advertisements, newspapers and the like.
- Review of equivalent common fractions, decimals and percentages, including familiarity with special cases (e.g. \( \frac{a}{b} = 0.25 = 25\% \)), through expressing survey results as fractions and percentages (e.g. the percentage and fraction of circle occupied by particular sectors of a pie chart).
- Use interactive fraction model tools (e.g. NCTM Illuminations and NLVM).

#### Proficiencies

- Understanding through identifying appropriate ways of displaying particular sets of data.
- Fluency through accurately creating data displays and calculating survey results and pie graph sectors as fractions and percentages.
- Problem solving through carrying out and making appropriate choices in the survey investigation, and communicating the results using the language and conventions of statistics.
- Reasoning through interpreting and critically appraising data displays.

### Considering different levels

**Level 6**

Students who are working at this level could:
- Discuss the interpretation of secondary data obtained from digital and other media.

**Level 8**

Students who are working at this level could:
- Explore the practicality of obtaining data from primary sources through observation or sampling, or from secondary sources, and the strengths and limitations of obtaining data in these ways.

### Assessment ideas

Students:
- Carry out a survey investigation
- Formulate questions that can be addressed with data
- Collect, organise, and display relevant data
- Interpret and evaluate the displays to answer the questions.

### Resources

- ABS Census at school (see classroom activities and resources section)
- AMSI Categorical data activity
- AMSI Data investigation and interpretation
- NCTM Illuminations
- Data graphers
- Fraction models
- Scootle
- Survey tools and learning objects for collection, display, comparison and interpretation of data

### Notes

- The time allocation is a guide only.
- The content descriptions specifically addressed.
- Bold text indicates the specific excerpt/s of the achievement standard.
- Aspects of the proficiencies that articulate how students can engage with the content whilst working mathematically.
- The assessment ideas provided draw upon the activities.
- A notes section is provided to encourage reflection on what worked well or needs modification in the future.