**Statistics and Probability**

**Materials**

Printed graph with no labels

**Data representation and interpretation**

**Years 3-7**

**Task: Graphs tell stories**

***What could this graph be about? What could you add to it to convey meaning?***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | 0 |  |  |  |  | (Use this stem and leaf plot for Year 7) |
| 1 | | | | | | | | | |
|  |  |  |  | 2 | 2 |  |  |  |  |
|  |  |  | 2 | 3 |  |  |  |  |  |
|  |  |  | 4 | 4 | 5 | 8 |  |  |  |
|  |  |  | 3 | 5 |  |  |  |  |  |
|  |  | 2 | 5 | 6 | 4 | 5 |  |  |  |
|  | 1 | 3 | 0 | 7 | 2 |  |  |  |  |
|  |  |  | 4 | 8 | 5 |  |  |  |  |
| 1 | 3 | 5 | 7 | 9 | 4 | 1 | 6 | 1 | 8 |
|  |  | 6 | 6 | 10 | 2 | 0 | 1 |  |  |

**Questions and prompts**

* What do you think the graph is about? What story could it be telling?
* What heading would tell what the graph is about?
* What numbers could you use to say how many (to quantify?)
* What do the numbers represent?
* What could the two axes represent?
* Do you need to label/name the axis? How would you describe them?
* What question might have been asked that lead to this graph being drawn?
* What is the range of the data?
* If the student has used a scale ask them to explain it
* Represent the data in another way
* What else could the data show?

**Mathematical ideas**

* **Statistics** involves using data in the form of numbers and graphs to describe our world.
* **Data** are not just numbers – they are numbers in context.
* Data can be represented as a graph – the graph ‘tells a story’ that can be read and interpreted. Labels on the axis of a column graph represent number (frequency) and categories.
* *A stem and leaf plot is a method of organizing and displaying numerical data in which each data value is split in to two parts, a ‘stem’ and a ‘leaf’.*

*Australian Curriculum: Mathematics Glossary, ACARA, v8, 2015.*

* A statistical inquiry is a four step process involving:
  + - Formulating questions
    - Collecting and organising data
    - Representing data
    - Analysing, interpreting data and drawing conclusions

**Australian Curriculum**

**Proficiency Strands – *understanding, fluency, problem solving and reasoning*** Teachers consider and emphasise the mathematical actions that are relevant and important to this task.

**Relevant content descriptions**

Year 3

* Identify questions or issues for categorical variables. Identify [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) sources and plan methods of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) collection and recording [(ACMSP068)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP068)
* Collect [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data), organise into categories and create displays using lists, tables, [picture graphs](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Picture+graphs) and simple column graphs, with and without the use of digital technologies [(ACMSP069)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP069)
* Interpret and compare [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) displays [(ACMSP070)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP070)

Year 4

* Select and trial methods for [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) collection, including survey questions and recording sheets [(ACMSP095)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP095)
* Construct suitable [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) displays, with and without the use of digital technologies, from given or collected [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data). Include tables, column graphs and [picture graphs](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Picture+graphs) where one picture can represent many [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) values [(ACMSP096)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP096)
* Evaluate the effectiveness of different displays in illustrating [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) features including variability [(ACMSP097)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP097)

Year 5

* Pose questions and collect categorical or [numerical data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Numerical+data) by observation or survey [(ACMSP118)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP118)
* Construct displays, including column graphs, dot plots and tables, appropriate for [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) type, with and without the use of digital technologies [(ACMSP119)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP119)
* Describe and interpret different [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) sets in context [(ACMSP120)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP120)

Year 6

* Interpret and compare a range of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) displays, including side-by-side column graphs for two categorical variables [(ACMSP147)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP147)
* Interpret secondary [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) presented in digital media and elsewhere [(ACMSP148)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP148)

Year 7

* Identify and investigate issues involving [numerical data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Numerical+data) collected from primary and secondary sources [(ACMSP169)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP169)
* Construct and compare a range of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) displays including stem-and-leaf plots and dot plots [(ACMSP170)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP170)
* Calculate [mean](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Mean), [median](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Median), [mode](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Mode) and range for sets of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data). Interpret these statistics in the context of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) [(ACMSP171)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP171)
* Describe and interpret [data](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Data) displays using [median](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Median), [mean](http://www.australiancurriculum.edu.au/glossary/popup?a=M&t=Mean) and range [(ACMSP172)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACMSP172)

**Learning intention/s – be specific and write your own**