


# Booragul Public School NSW Syllabus for the Australian Curriculum – Statistics and Probability

<b>Sub Strand – Data 1</b>			
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date
<b>Stage 2</b> A student: <ul style="list-style-type: none"> <li>› uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA2-1WM</li> <li>› selects and uses appropriate mental or written strategies, or technology, to solve problems MA2-2WM</li> <li>› checks the accuracy of a statement and explains the reasoning used MA2-3WM</li> <li>› selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs MA2-18SP</li> </ul>	<b>Language</b> Students should be able to communicate using the following language: information, data, collect, category, display, symbol, list, table, <b>column graph</b> , picture graph, <b>vertical columns</b> , <b>horizontal bars</b> , equal spacing, <b>title</b> , key, <b>vertical axis</b> , <b>horizontal axis</b> , <b>axes</b> , <b>spreadsheet</b> . Column graphs consist of vertical columns or horizontal bars. However, the term 'bar graph' is reserved for divided bar graphs and should not be used for a column graph with horizontal bars.		
<b><u>Ignition Activity</u></b> Conduct a whole class survey on the students favourite colour/fruit etc Record the information on a table using a tally mark. Emphasise the meaning/importance of the fifth tally mark.  Pose questions that the students can interpret <ol style="list-style-type: none"> <li>1. Which colour/fruit was the favourite?</li> <li>2. Which was the least?</li> <li>3. How many altogether?</li> </ol> From the whole class survey, discuss the language of it. For example; tally marks, table, data, survey.			 Sustainability Literacy Critical and creative thinking
<b>Combination Dice</b> Students roll two dice 30 times, add the two numbers and keep a tally of the results. The data is transferred to a column graph and the students interpret the data. <i>Which number came up most/least often?</i> <i>Did any two numbers come up the same number of times? What were they?</i>			
<b><u>Explicit Mathematical Teaching</u></b> This topic provides many opportunities for students to collect information about a variety of areas of interest and can be readily linked with other key learning areas such as Human Society and Its Environment (HSIE) and Science. Data could also be collected from the Internet. Column graphs consist of vertical columns or horizontal bars. However, the term 'bar graph' is reserved for divided bar graphs and should not be used for a column graph with horizontal bars.			

What surveys are used for and the importance of them. Real life examples such as traffic surveys, census. Students brainstorm other applications of surveys.

Aspects of a survey. Why do a survey?

1. You want to answer a question
2. Want to make change
3. Make decisions
4. Provide goods/services

What are the features of a survey

1. Purpose/Title (see above)
2. Participants (Who/What you are surveying)
3. Data (What questions? Qualitative (red, blue, green) or quantitative (number or yes no)
4. Collect data (how to collect- people, looking at stats)
5. How to organise the data (tables, graphs)
6. How will the data answer the question
7. What will you do with the results

Identify questions or issues for categorical variables; identify data sources and plan methods of data collection and recording

- recognise that data can be collected either by the user or by others
- identify possible sources of data collected by others, eg newspapers, government data collection agencies, sporting agencies, environmental groups
- pose questions about a matter of interest to obtain information that can be recorded in categories
- predict and create a list of categories for efficient data collection in relation to a matter of interest, eg 'Which breakfast cereal is the most popular with members of our class?'
- identify issues for data collection and refine investigations, eg 'What if some members of our class don't eat cereal?' (Problem Solving)

Collect data, organise it into categories, and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies

- collect data and create a list or table to organise the data, eg collect data on the number of each colour of lollies in a packet

Colour	Number of lollies
Red	5
Blue	2
Yellow	7
Green	1

- use computer software to create a table to organise collected data, eg a spreadsheet (Communicating)

- construct vertical and horizontal column graphs and picture graphs that represent data using one-to-one correspondence

<ul style="list-style-type: none"> <li>• use grid paper to assist in constructing graphs that represent data using one-to-one correspondence (Communicating)</li> <li>• use the terms 'horizontal axis', 'vertical axis' and 'axes' appropriately when referring to column graphs (Communicating)</li> <li>• use graphing software to enter data and create column graphs that represent data (Communicating)</li> <li>• mark equal spaces on axes, name and label axes, and choose appropriate titles for column graphs (Communicating)</li> <li>• choose an appropriate picture or symbol for a picture graph and state the key used (Communicating)</li> </ul>		
<p>Interpret and compare data displays</p> <ul style="list-style-type: none"> <li>• describe and interpret information presented in simple tables, column graphs and picture graphs</li> <li>• make conclusions about data presented in different data displays, eg 'Football is the most popular sport for students in Year 3 at our school' (Communicating, Reasoning)</li> <li>• represent the same data set using more than one type of display and compare the displays</li> <li>• discuss the advantages and/or disadvantages of different representations of the same data (Communicating, Reasoning)</li> </ul>		
<h2><b><u>Whole Class Teaching Activities</u></b></h2> <p>Show an example of a survey that the students will be interested. Is it worth selling ... in the canteen? Go through each of the above questions. Come to a conclusion and present the information to the canteen.</p>		
<p><b>Using Maths Tracks-Stage 2A, Unit 36-Data Entry</b></p> <p>One of a series of teaching units to accompany the Rigby/Harcourt series 'Maths Tracks'. Student activities include constructing vertical and horizontal column graphs and picture graphs on grid paper using one-to-one correspondence; marking equal spaces on axes, labelling axes and naming the display; interpreting information presented in column graphs and picture graphs; representing the same data in more than one way. Meets BoS outcomes DS2.1, WMS2.1, WMS2.2. Click on link below. <a href="http://lrr.dlr.det.nsw.edu.au/LRRDownloads/7900/1/44263_2A_U36_Print_1.pdf">http://lrr.dlr.det.nsw.edu.au/LRRDownloads/7900/1/44263_2A_U36_Print_1.pdf</a></p>		
<p><b>Picture Graphs from Information in the Print Media/Internet</b></p> <ul style="list-style-type: none"> <li>• Ask children to construct picture graphs using information from books, newspapers or internet sites eg population of Australian cities, car production of major brands</li> <li>• Discuss the advantages and/or disadvantages of picture graphs</li> <li>• Investigate alternate ways of displaying data</li> <li>• use grid paper to assist in constructing graphs that represent data using one-to-one correspondence</li> <li>• use the terms 'horizontal axis', 'vertical axis' and 'axes' appropriately when referring to column graphs</li> <li>• use graphing software to enter data and create column graphs that represent data</li> </ul>		
<p><b>Favourite Drinks</b></p> <ul style="list-style-type: none"> <li>• Children survey a class of their choice about their favourite drinks.</li> </ul>		

- Students construct their own two-way table using the information gathered
  - Compare results for boys and girls
  - mark equal spaces on axes, name and label axes, and choose appropriate titles for column graphs
  - choose an appropriate picture or symbol for a picture graph and state the key used
- Extension activity:** students may transfer the data into computer data software ie excel, word, publisher etc.



**Activities**

- Fundraiser activity
- Students to come up with a possible fundraiser by developing a survey for their peers to answer. They will need to;
- Decide who will answer the survey
  - What options will participants have (qualitative)
  - Collect data and then in class decide/discuss how they will organise the data
  - Students describe and interpret information presented
  - As a class come to a consensus about the data
- Demonstrate how to organise the data into a table. Identify the column headings and the row headings, based on the survey. Identify the tally and frequency of answers.
- Independent activity- You are going to start a car sales yard and you want to know what colour/type of cars you should have for sale. You want to collect data on the most popular colour/type of cars in your area. How could you do this?
- In pairs the students create their own survey/table
  - Students collect their data. Locations could include the carpark, or front of school taking into consideration the safety of students.
  - Draw conclusions from the data as a class.
  - Students describe and interpret information presented
- Students brainstorm other possible surveys of interest and design the questions to be asked. Students 'make up' possible answers and complete a table to show the answers.

<p>Show students several tables without the headings. Students decide what the survey may have been about. Students write/draw the possible scenario.</p> <p>Show students an incomplete table and let them fill them in based on a particular survey eg How many children walk/ride/bus/car to school?</p>		
<p><b>Using Maths Tracks-Stage Two-Data-Interpreting Data</b>  One of a series of teaching units to accompany the Rigby/Harcourt series 'Maths Tracks'. You don't need the maths Tracks books to find this useful. Student activities include gathering data and keeping track of what has been counted by using concrete materials, tally marks, words or symbols; displaying data using concrete materials and pictorial representations; using objects as symbols to represent data using one-to-one correspondence eg using a block to represent each car; interpreting information presented in picture graphs. Scroll through for some interesting activities- suitable to project on screen. Click on hyperlink below to access this resource.  <a href="http://lrr.dlr.det.nsw.edu.au/LRRDownloads/6971/1/44113_S1A_U13_Print.pdf">http://lrr.dlr.det.nsw.edu.au/LRRDownloads/6971/1/44113_S1A_U13_Print.pdf</a></p>		
<p><b>Preparation for work and study unit on Graphs –Numeracy –Stage Two</b>  This has slideshows and worksheets to support your teaching of the data strand. Click on the hyperlink below to access it.  <a href="http://lrr.dlr.det.nsw.edu.au/Web/pws2/graphs_index/index.htm">http://lrr.dlr.det.nsw.edu.au/Web/pws2/graphs_index/index.htm</a></p>		
<p><b>Using Maths Tracks-Data-Picture and Column Graphs</b>  One of a series of teaching units to accompany the Rigby/Harcourt series 'Maths Tracks'. (You don't need the books to find this useful. Student activities include constructing vertical and horizontal column graphs and picture graphs on grid paper using one-to-one correspondence; representing the same data in more than one way; interpreting information presented in column graphs and picture graphs. Meets BoS outcomes DS2.1, WMS2.1, WMS2.2, WMS2.4. Includes teacher notes. Click on hyperlink below  <a href="http://lrr.dlr.det.nsw.edu.au/LRRDownloads/8191/1/44331_2B_u44_Print.pdf">http://lrr.dlr.det.nsw.edu.au/LRRDownloads/8191/1/44331_2B_u44_Print.pdf</a></p>		
<p><b>Using Maths Tracks-Stage two-Data-Two Way tables</b>  One of a series of teaching units to accompany the Rigby/Harcourt 'Maths Tracks'. Student activities include creating a two-way table to organise data; interpreting information presented in two-way tables. Meets BoS outcomes DS2.1, WMS2.1. Includes teacher notes. Click on link below and scroll through for useful activities  <a href="http://lrr.dlr.det.nsw.edu.au/LRRDownloads/7910/1/44274_2A_U47_Print_1.pdf">http://lrr.dlr.det.nsw.edu.au/LRRDownloads/7910/1/44274_2A_U47_Print_1.pdf</a></p>		
<p><b>These are the results of a survey. What might the survey be about?</b>  Accept any reasonable suggestions. For example it could be a survey of where children like playing, a survey to show where accidents have happened etc</p>		

Place	Tally
Library	III
Play equipment	HHH HHH II
Under the trees	HHH II
Oval	III

### Colour of Car Survey

Discuss the process for the survey. Students prepare a tally sheet in their books. Students estimate the most popular car colour passing the school. Sample 100 cars approximately.

Students use tally sheet to complete a table and then a graph of the data.

Students write questions that could be answered using the graph/table.

Publish graph using computer software.

### Missing Info

Provide students with graphs that have parts missing, eg title, labels, scale. Discuss what information can be learned from the graphs and the importance of the missing information.

### No Information

Provide graphs with no title, axes titles, scale. Ask students to suggest possible scenarios that explain the graph.

### Secret Data

The teacher displays a graph on an overhead with the vertical axis marked in centimetres and the horizontal axis labelled with the letters A to M, but with no title. In small groups, students discuss what the title could be and record suggestions and reasons. Each group then chooses its best title and reports back to the class arguing the merits of its choice. The class decides which is the most appropriate title for the graph.

Possible questions include:

- what strategies did you use to decide on your title?
- what information do you need on a graph to interpret data correctly?
- Students describe and interpret information presented

## Guided Group and Independent Activities

### Mystery Graph

- Each child draws a mystery graph with no heading or labels on axes
- Trade graphs with a partner who:
  - Gives the graph a title
  - Labels axes
  - Marks the scale

- Justifies their choice of title
- Makes up some questions that can be answered using the graph
- Students describe and interpret information presented
- Students discuss their questions with their partner

**Use simple graphing software to enter data**  
**Questioning:**

- Pose questions that can be answered using the information from a table.
- Students need to be able to pose questions from tables also.

**Create a two-way table to organise data**  
 eg

Drinks	Boys	Girls
Milk	5	6
Water	3	2
Juice	2	1

**Interactive Technology**

Click on links below for a variety of interactive activities and lesson ideas relating to data

<http://www.yowiebay-p.schools.nsw.edu.au/math.htm>

<http://www.gamequarium.com/data.html>

<http://www.primaryschool.com.au/mathematics-lessonsresults.php?strand=Data&unit=Gathering%20Organising%20Tabulating%20Graphing&grade=56>

**Planned Assessment**

**Pre Assessment**  
 Use a packet of smarties or counters of a variety of colours to construct a table. Each student has different results. How can you show to others the information you have found.

**Dice Numbers**

- Organise children into groups and give each group a die.
- Each student takes it in turn to roll the die.
- The group records the number of times each number is rolled using tally marks.
- Continue until the die has been rolled a nominated number of times.

- Record results in a simple table.

#### **Lunch Orders**

- Survey children who order their lunch from the school canteen.
- Record their purchases in tally form.
- Revise the conventions of a column graph eg labelling axes, naming graph, equal spacing on axis, vertical/horizontal etc
- Students draw their own column graph based on the data collected.

#### **Pre Assessment**

Provide a graph for students to view. Ask students to pose questions about the graph. Students select the most suitable question.

Ask students to suggest a possible title for the graph and provide justification for their responses.

#### **Name The Graph**

Students are presented with a bar graph that is not labelled in any way and asked to respond to the following

-what do you think this might be the graph of?

-Put names and numbers on the graph to show what you mean

Write down three things you know from your graph

(from Mathematics Assessment for learning: Rich tasks and Work Samples, Australian Catholic University)