

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

Sub Strand – Data 2			
Outcome	Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date
Stage 2 A student: <ul style="list-style-type: none"> › uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA2-1WM › selects and uses appropriate mental or written strategies, or technology, to solve problems MA2-2WM › checks the accuracy of a statement and explains the reasoning used MA2-3WM › selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs MA2-18SP 	Language Students should be able to communicate using the following language: data, collect, survey , recording sheet , rating scale , category, display, symbol, tally mark, table, column graph, picture graph, vertical columns, horizontal bars, scale , equal spacing, title, key, vertical axis, horizontal axis, axes, spreadsheet, misleading . Refer also to language in Data 1.		
<u>Ignition Activity</u> Conduct a whole class survey on the students favourite colour/fruit 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"> 1. Which colour/fruit was the favourite? 2. Which was the least? 3. How many altogether? From the whole class survey, discuss the language of it. For example; tally marks, table, data, survey.			 <div style="display: flex; flex-direction: column; align-items: center; gap: 5px;"> Personal and social capability Ethical understanding Information and communication technology capability Sustainability Literacy Critical and creative thinking </div>
Combination Dice 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>			
<u>Explicit Mathematical Teaching</u> Select and trial methods for data collection, including survey questions and recording sheets <ul style="list-style-type: none"> • create a survey and related recording sheet, considering the appropriate organisation of categories for data collection • choose effective ways to collect and record data for an investigation, eg creating a survey with a scale of 1 to 5 to indicate preferences (1 = don't like, 2 = like a little, 3 = don't know, 4 = like, 5 = like a lot) (Communicating, Problem Solving) • refine survey questions as necessary after a small trial <div style="text-align: right; margin-top: 10px;">~ 1 ~</div>			

<p>▮ discuss and decide the most suitable question to investigate a particular matter of interest, eg by narrowing the focus of a question from 'What is the most popular playground game?' to 'What is the most popular playground game among Year 3 students at our school?' (Communicating, Reasoning)</p> <ul style="list-style-type: none"> • conduct a survey to collect categorical data <p>▮ after conducting a survey, discuss and determine possible improvements to the questions or recording sheet (Communicating, Reasoning)</p> <ul style="list-style-type: none"> • compare the effectiveness of different methods of collecting and recording data, eg creating categories of playground games and using tally marks, compared to asking open-ended questions such as 'What playground game do you like to play?' <p>▮ discuss the advantages and/or disadvantages of open-ended questions in a survey, compared to questions with predetermined categories (Communicating, Reasoning)</p>		
<p>Construct suitable data displays, with and without the use of digital technologies, from given or collected data; include tables, column graphs and picture graphs where one picture can represent many data values (ACMSP096)</p> <ul style="list-style-type: none"> • represent given or collected categorical data in tables, column graphs and picture graphs, using a scale of many-to-one correspondence, with and without the use of digital technologies <p>▮ discuss and determine a suitable scale of many-to-one correspondence to draw graphs for large data sets and state the key used, eg = 10 people, if there are 200 data values (Communicating, Reasoning)</p> <p>▮ use grid paper to assist in drawing graphs that represent data using a scale of many to one correspondence (Communicating)</p> <p>▮ use data in a spreadsheet to create column graphs with appropriately labelled axes (Communicating, Problem Solving)</p> <p>▮ mark equal spaces on axes, name and label axes, and choose appropriate titles for graphs (Communicating)</p>		
<p>Evaluate the effectiveness of different displays in illustrating data features, including variability</p> <ul style="list-style-type: none"> • interpret and evaluate the effectiveness of various data displays found in media and in factual texts, where displays represent data using a scale of many-to-one correspondence <p>▮ identify and discuss misleading representations of data (Communicating, Reasoning)</p> <p>▮ discuss and compare features of data displays, including considering the number and appropriateness of the categories used, eg a display with only three categories (blue, red, other) for car colour is not likely to be useful (Communicating)</p> <p>▮ discuss the advantages and disadvantages of different representations of the same categorical data, eg column graphs compared to picture graphs that represent data using scales of many-to-one correspondence (Communicating)</p>		
<p><u>Whole Class Teaching Activities</u></p> <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>Using Maths Tracks-Stage 2A, Unit 36-Data Entry 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. http://lrr.dlr.det.nsw.edu.au/LRRDownloads/7900/1/44263_2A_U36_Print_1.pdf</p>		
<p>Picture Graphs from Information in the Print Media/Internet</p> <ul style="list-style-type: none"> • Ask children to construct picture graphs using information from books, newspapers or internet sites eg population of Australian cities, car production of major brands • Discuss the advantages and/or disadvantages of picture graphs, column graphs and tables • For large data sets students determine a suitable scale of many to one correspondence • Students use data in a spreadsheet to create column graphs with appropriately labelled axes. 		
<p>Playground games</p> <ul style="list-style-type: none"> • Children survey a class of their choice about their favourite thing of their choice eg playground games • Students select and trial methods for data collection including survey questions and recording sheets. • Students construct their own two-way table using the information gathered • Students then refine survey questions as necessary after a small trial and re-conduct the survey to collect categorical data. • Compare the effectiveness of different methods of collecting and recording data eg tally marks verses open ended questions. 		
<p>Activities</p> <ul style="list-style-type: none"> • Fundraiser activity <p>Students to come up with a possible fundraiser by developing a survey for their peers to answer. They will need to;</p> <ul style="list-style-type: none"> ○ Decide who will answer the survey ○ What options will participants have ie open ended or tally questions (qualitative) ○ Collect data and then in class decide/discuss how they will organise the data eg table, picture graph or column graph. Students should use as many one to one correspondence as possible ○ As a class come to a consensus about the data <p>Demonstrate how to organise the data into a table, column graph or picture graph. Identify the column headings and the row headings, axes and title for graphs and tables. Identify the tally and frequency of answers.</p> <p>Students compare their representation of data to evaluate effectiveness of different displays.</p>		
<p>Using Maths Tracks-Stage Two-Data-Interpreting Data 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</p>		

<p>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.</p> <p>http://lrr.dlr.det.nsw.edu.au/LRRDownloads/6971/1/44113_S1A_U13_Print.pdf</p>		
<p>Preparation for work and study unit on Graphs –Numeracy –Stage Two This has slideshows and worksheets to support your teaching of the data strand. Click on the hyperlink below to access it.</p> <p>http://lrr.dlr.det.nsw.edu.au/Web/pws2/graphs_index/index.htm</p>		
<p>Using Maths Tracks-Data-Picture and Column Graphs 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</p> <p>http://lrr.dlr.det.nsw.edu.au/LRRDownloads/8191/1/44331_2B_u44_Print.pdf</p>		
<p>Using Maths Tracks-Stage two-Data-Two Way tables 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</p> <p>http://lrr.dlr.det.nsw.edu.au/LRRDownloads/7910/1/44274_2A_U47_Print_1.pdf</p>		
<p>Plants in the vegetable patch/garden Discuss the process for the survey. Students select method for data collection Students complete data collection Students construct a suitable data display with and without the use of digital technologies. Students use a suitable scale of many to one correspondence. Students write questions that could be answered using the graph/table. Students evaluate the effectiveness of different displays in illustrating data features, including variability. Discuss advantages and disadvantages of different representations and then students identify and discuss misleading representations of data.</p>		
<p><u>Guided Group and Independent Activities</u> A Day's Activities</p> <ul style="list-style-type: none"> • Students collect data on how they spend a day eg sleeping, at school, watching TV, eating, playing, other activities. • The students colour in a square (or part of a square) on a graph to represent time spent of the day. Students are to determine the scaling of the graph. • Times spent on the various activities are compared and discussed. • Students are then to compare graphs and discuss the misleading representation of data through the use of different scales ie a student's using one block for an hour verses one using a block for 20 minutes. 		

Media Graphs

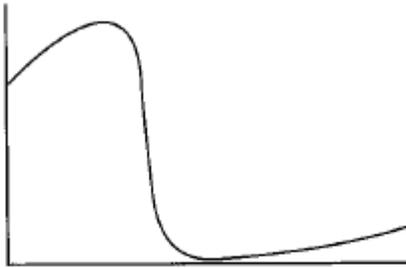
Students collect a variety of graphs used in the media and in factual texts. They consider each graph separately.

Possible questions include:

- What type of graph is used? What is its purpose?
- What information can you interpret from the graph?
- Who would use the information?
- Who produced the graph and why?
- Is the graph misleading? Why?

Students represent the information in a different way.

This is a graph of how hungry you are.



What times of day might be represented by the graph?

Can children relate points on the graph to appropriate times of day? They might like to discuss what the graph would look like near meal times, and before and after meal times.

Open-Ended Maths Activities-Using 'Good' Questions to enhance learning in Mathematics
By Peter Sullivan and Pat Liburn

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)