Australian Curriculum - Mathematics - Statistics and Probability (Strands and Sub-strands with Elaborations)

PROGRESSION IS HIGHLIGHTED IN THE FOLLOWING DOCUMENT VIA **BOLDED** TEXT.

General Capabilities						
Literacy	Numeracy	ICT capability	Critical and creative thinking	Personal and social capability	Ethical understanding	Intercultural understanding

		Cross-curriculum priorities		
		Aboriginal and Torres Strait Islander histories and cultures	Asia and Australia's engagement with Asia	Sustainability

Year Level Indicators	PROFICIENCY STRANDS The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.	Sub-strands			
		Chance		Data representation and interpretation	
		Content Descriptor	Elaborations	Content Descriptor	Elaborations
Foundation	Sourced from Year level descriptions acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',...**Problem Solving** includes…,' ',...discussing the reasonableness of the answer'	N/A	N/A	Answer yes/no questions to collect information (ACMSP011)	* Posing questions about themselves and familiar objects and events * Representing responses to questions using simple displays, including grouping students according to their answers * Using data displays to answer simple questions such as 'how many
Foundation Year Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	N/A	N/A	Students answer simple questions to collect information.	
Year 1	Sourced from Year level descriptions acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',...**Reasoning** includes…,' ',...**justifying representations of data**…,'	**Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen'** (ACMSP024)	* Justifying that some events are certain or impossible	**Choose** simple questions and **gather responses** (ACMSP262) **Represent data with objects and drawings where one object or drawing represents one data value.** **Describe the displays** (ACMSP263)	* Determining which questions will gather appropriate responses for a simple investigation * Understanding one-to-one correspondence * Describing displays by identifying categories with the greatest or least number of objects
Year 1 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	Students **classify** outcomes of **simple** familiar events.		Students describe data displays. They collect data by asking questions and **draw** simple data displays.	

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Year 2	**Sourced from Year level descriptions** acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',...**Fluency** includes…,' ',...using the language **of chance to describe outcomes of familiar chance events…,'** ',...**Reasoning** includes...,' ',...**creating and interpreting simple** representations of data'	Identify **practical activities and everyday** events that involve chance. Describe outcomes as **'likely' or 'unlikely' and identify some events as 'certain' or 'impossible'** (ACMSP047)	* Classifying a list of everyday events according to how likely they are to happen, using the language of chance, and explaining reasoning	**Identify a question of interest based on one categorical variable.** Gather data relevant to the question (ACMSP048)	* Determining the variety of birdlife in the playground and using a prepared table to record observations
				Collect, **check and classify** data (ACMSP049)	* Recognising the usefulness of tally marks * Identifying categories of data and using them to sort data
				Create displays of data **using lists, table and picture graphs and interpret them** (ACMSP050)	* Creating picture graphs to represent data using one-to-one correspondence * Comparing the usefulness of different data displays
Year 2 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	They describe outcomes for everyday events.		Students make sense of collected information.	
				Students collect data from relevant questions to create lists, tables and picture graphs.	

Year 3	**Sourced from Year level descriptions** acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',...**Fluency** includes...,' ',...**identifying** and describing outcomes of chance **experiments**...,' ',...**Problem Solving** includes formulating and **modelling** authentic situations **involving planning methods of data collection and representation**...,' ',...**Reasoning** includes...,' ',...creating and interpreting **variations in the results of data collections and data displays**'	**Conduct** chance experiments, identify and describe possible outcomes and **recognise variation in results** (ACMSP067)	* Conducting repeated trials of chance experiments such as tossing a coin or drawing a ball from a bag and identifying the variations between trials	Identify questions **or issues** for categorical variable**s.** **Identify data sources and plan methods of data collection and recording** (ACMSP068)	* Refining questions and planning investigations that involve collecting data, and carrying out the investigation (for example narrowing the focus of a question such as 'which is the most popular breakfast cereal?' to 'which is the most popular breakfast cereal among Level 3 students in our class?')
				Collect data, **organise into categories** and create displays using lists, tables, picture graphs and **simple column graphs, with and without the use of digital technologies** (ACMSP069)	* Exploring meaningful and increasingly efficient ways to record data, and representing and reporting the results of investigations * Collecting data to investigate features in the natural environment
				Interpret and compare data displays (ACMSP070)	* Comparing various student-generated data representations and describing their similarities and differences
Year 3 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	Students conduct chance experiments and list possible outcomes.		They interpret and compare data displays.	
				They carry out simple data investigations for categorical variables.	

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Year 4	**Sourced from Year level descriptions** acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',…**Fluency** includes…,' ',…collecting and recording data...,' ',…**Reasoning** includes...,' ',…communicating information using graphical displays and **evaluating the appropriateness of different displays'**	Describe **possible** everyday events and **order their chances of occurring** (ACMSP092)	* Using lists of events familiar to students and ordering them from 'least likely' to 'most likely' to occur	**Select and trial methods** for data collection, **including survey questions and recording sheets** (ACMSP095)	* Comparing the effectiveness of different methods of collecting data * Choosing the most effective way to collect data for a given investigation
		Identify everyday events **where one cannot happen if the other happens** (ACMSP093)	* Using examples such as weather, which cannot be dry and wet at the same time	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)	* Exploring ways of presenting data and showing the results of investigations * Investigating data displays using many-to-one correspondence
		Identify events where the chance **of one will not be affected by the occurrence of the other** (ACMSP094)	* Explaining why the probability of a new baby being either a boy or a girl does not depend on the sex of the previous baby	**Evaluate the effectiveness** of different displays **in illustrating data features including variability** (ACMSP097)	* Interpreting data representations in the media and other forums in which symbols represent more than one data value * Suggesting questions that can be answered by a given data display and using the display to answer questions
Year 4 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	Students identify dependent and independent events. Students list the probabilities of everyday events.		They **describe** different methods for data collection and representation, and evaluate their effectiveness. They construct data displays from given or collected data.	

	Sourced from Year level descriptions				
Year 5	acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',…**Reasoning** includes…,' ',…**interpreting results** of chance **experiments**, **posing appropriate questions for data investigations** and interpreting data **sets**'	List outcomes of chance experiments involving **equally likely** outcomes and **represent probabilities of those outcomes using fractions** (ACMSP116)	* Commenting on the likelihood of winning simple games of chance by considering the number of possible outcomes and the consequent chance of winning in simple games of chance such as jankenpon (rock/paper/scissors)	Pose questions and collect **categorical or numerical** data by **observation** or survey (ACMSP118)	* Posing questions about insect diversity in the playground, collecting data by taping a one-metre-square piece of paper to the playground and observing the type and number of insects on it over time
		Recognise that **probabilities range from 0 to 1** (ACMSP117)	* Investigating the probabilities of all outcomes for a simple chance experiment and verifying that their sum equals 1	Construct displays, including column graphs, **dot plots** and tables, appropriate for data type, with and without the use of digital technologies (ACMSP119)	* Identifying the best methods of presenting data to illustrate the results of investigations and justifying the choice of representations
				Describe and interpret different data **sets** in context (ACMSP120)	* Using and comparing data representations for different data sets to help decision making
Year 5 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	Students list outcomes of chance experiments with equally likely outcomes and assign probabilities between 0 and 1.		Students **compare** and interpret different data sets.	
				Students pose questions to gather data, and construct data displays appropriate for the data.	

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Year 6	Sourced from Year level descriptions acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',…**Problem Solving** includes…,' ',…interpreting **secondary data displays**…,' ',…**Reasoning** includes...,' ',…**explaining why the actual results of chance experiments may differ from expected results**'	Describe probabilities **using fractions, decimals and percentages** (ACMSP144)	* Investigating games of chance popular in different cultures and evaluating the relative benefits to the organisers and participants (for example Pachinko)	Interpret and compare **a range** of data displays, **including side-by-side column graphs for two categorical variables** (ACMSP147)	* Comparing different student-generated diagrams, tables and graphs, describing their similarities and differences and commenting on the usefulness of each representation for interpreting the data * Understanding that data can be represented in different ways, sometimes with one symbol representing more than one piece of data, and that it is important to read all information about a representation before making judgments
		Conduct chance experiments **with both small and large numbers of trials using appropriate digital technologies** (ACMSP145)	* Conducting repeated trials of chance experiments, identifying the variation between trials and realising that the results tend to the prediction with larger numbers of trials	Interpret **secondary data presented in digital media and elsewhere** (ACMSP148)	* Investigating data representations in the media and discussing what they illustrate and the messages the people who created them might want to convey * Identifying potentially misleading data representations in the media, such as graphs with broken axes or non-linear scales, graphics not drawn to scale, data not related to the population about which the claims are made, and pie charts in which the whole pie does not represent the entire population about which the claims are made
		Compare observed frequencies across experiments with expected frequencies (ACMSP146)	* Predicting likely outcomes from a run of chance events and distinguishing these from surprising results		
Year 6 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	Students compare observed and expected frequencies. Students list and communicate probabilities using simple fractions, decimals and percentages.		They interpret and compare a variety of data displays including those displays for two categorical variables. They evaluate secondary data displayed in the media.	

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Year 7	Sourced from Year level descriptions acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY 'At this level:…,' ',…Problem Solving includes…,' ',…interpreting sets of data collected through chance experiments Reasoning includes…,' ',…interpreting data displays'	Construct sample spaces for single-step experiments with equally likely outcomes (ACMSP167)	* Discussing the meaning of probability terminology (for example probability, sample space, favourable outcomes, trial, events and experiments) * Distinguishing between equally likely outcomes and outcomes that are not equally likely	Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169)	* Obtaining secondary data from newspapers, the Internet and the Australian Bureau of Statistics * Investigating secondary data relating to the distribution and use of non-renewable resources around the world
		Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)	* Expressing probabilities as decimals, fractionals and percentages	Construct and compare a range of data displays including stem and leaf plots and dot plots (ACMSP170)	* Understanding that some data representations are more appropriate than others for particular data sets, and answering questions about those data sets * Using ordered stem-and-leaf plots to record and display numerical data collected in a class investigation, such as constructing a class plot of height in centimetres on a shared stem-and-leaf plot for which the stems 12, 13, 14, 15, 16 and 17 have been produced
				Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (ACMSP171)	* Understanding that summarising data by calculating measures of centre and spread can help make sense of the data
				Describe and interpret data displays using median, mean and range (ACMSP172)	* Using mean and median to compare data sets and explaining how outliers may affect the comparison * Locating mean, median and range on graphs and connecting them to real life
Year 7 Achievement Standard acara AUSTRALIAN CURRICULUM, ASSESSMENT AND REPORTING AUTHORITY	NOTE: The standards are not divided into Strands or Sub-strands in the Australian Curriculum documents. However, logic would dictate that the standards could be put into sub-strands, as demonstrated on the right.	Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes.		Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays. They calculate mean, mode, median and range for data sets. They construct stem and leaf plots and dot plots.	

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