Mathematics & Statistics Know: Content and Concepts

PHASE ONE

Number | Mātauranga tau

By the end of this phase, students know that our **number system is base 10** with ten digit symbols.The place value of a digit in a number depends on its position; as we move to the left, each column is worth ten times more. Zero is used as a placeholder.

Students know that they can use subitising patterns to support **estimations** and calculations. They know that numbers can be **partitioned and recombined** in different ways. Addition is putting parts together to find the total or whole. Subtraction takes parts away from the whole; it is also the difference or distance between numbers. Multiplication and division involve recognising and working with **equal groups**: how many are in each group, the number of groups, and the total amount in all groups.

Students know that **fractions are numbers** that can be described using words, pictures, or symbols. When fractions are represented symbolically, the bottom number (denominator) shows how many pieces a whole has been equally split into, and the top number (numerator) shows how many of those parts the fraction represents. The bigger the denominator of a fraction, the smaller the pieces.

Fractions show parts of a whole region, set of objects, or measurement; they also show the division of two numbers (the quotient).

Algebra | Taurangi

Students come to know that committing **maths facts** to memory allows them to be recalled fluently, so that attention is freed for working on more complex tasks.

The **equal sign is relational** in that it shows that the two sides of an equation representthe same quantity.

Students notice properties in basic operations: **inverse operations** undo each other (addition and subtraction, multiplication anddivision), the **commutative property** applies to addition and multiplication, the additive **identity** is 0, and the multiplicative **identity** is 1.

Students know that **patterns** can be made of elements, including numeric or spatial elements, in a sequence governed by a rule. Repeating patterns have a unit of repeat; growing patterns can increase or decrease.

Students also know that an **algorithm** is a set of step-by-step instructions to complete a task or solve a problem.

Measurement | Ine

By the end of this phase, students know that **systems of measurement** have a history and that different cultures use different approaches to measuring.

Students know that they can **measure and compare various attributes**, such as length, area, volume, capacity, mass (weight), temperature, duration, and turn, using informal or standard units. When measuring, the measurement units must remain the same and join up continuously with no gaps or overlaps. The measurement is the total number of units used from start to end.

Students also know that the distance around the edge of a two-dimensional shape gives perimeter, covering a surface gives area, and filling a three-dimensional shape gives capacity or volume.

Geometry | Āhuahanga

During this phase, students come to know that **patterns and regularities in shapes** can be used to compare, classify, and predict. Two- and three-dimensional shapes have **features** that can be observed and described using **geometric language**. Shapes and objects can flip (reflect), turn (rotate), slide (translate), and be used to create patterns. Objects can be rotated in space and may appear different from other **perspectives**.

Students know that **maps** are two-dimensional representations of places in the world with symbols to show locations and landmarks. The **position** of a location can be described relative to another location, including a known environmental feature.

Statistics | Tauanga

By the end of this phase, students know that **data** is information about the world, that it comes in many forms, and that it helps them to learn about people, their lives, and their environment. They know that a **statistical enquiry cycle** can be used to investigate a group using questions that they ask of the data. A variable refers to an attribute of the data, such as height, number of children, or colour. **Sorting and organising** variables helps to make sense of data and to answer **summary investigative** questions. **Data visualisations** are representations of all available values of one or more variables that reveal relationships or tell a story.

Probability | Tūponotanga

Students come to know that a chance-based situation has a set of possible outcomes that can be arranged into events. The probability of anevent is the chance of it occurring.

Phase One Number

Number Structure

Year 0/1	Year 2	Year 3	Teaching Methods/Representativess
Subitise the nos of objects in a grp up to 5 Subitise the nos of objects in a grp up to 10 including combining patterns of 1 - 5 objects	Group objects in a pattern of at least 10, subitise the no in each part and find the total number in the pattern using the parts	Estimate to the nearest 10 the no of objects in a collection of less than 100	› dot patterns, 10s frames, fingers (years 0–2) › materials that can be grouped in 10 (e.g., iceblock sticks) (year 3)
Count to 10 (to 20) forwards & backwards from any number **Count to 20 (to 100) forwards & backwards in 1s, 2s and 10s from any number**	**Count to 100, forwards & backwards, from any number in 1s, 2s 5s & 10s**	**Count to 1000, forwards & backwards, in 1s, 2s 3s 5s 10s & 100s from any number**	› number lines, 100s boards, number flip charts, 1,000s books
Recognise and represent the 10s and 1s structure of the teens numbers 11 - 19	**Recognise and represent the base ten structure if the numbers up to 100**	**Recognise and represent the base 10 structure of numbers up to 1000**	› 10s frames › ice block sticks, place-value (PV) blocks, PV money, PV houses, arrow cards
Identify, read and write whole numbers up to at least 10 *Identify, read* and write whole numbers up to at least 20	**Identify, read and write whole numbers up to at least 100**	**Identify, read and write whole numbers up to at least 1000**	100s boards, PV houses, number fans, number cards, words and numerals
Compare and order whole numbers up to at least 10 and ordinal numbers 1st 2nd using words Compare and order whole numbers up to at least 20 and ordinal numbers 1st 2nd using words or numerals with suffixes	Compare and order whole numbers up to at least 100	**Compare and order whole numbers up to at least 1000**	› 100s boards (years 0–2) › number flip chart, PV houses, number cards, digit cards, number lines
Partition up to 5 objects, and then 10 objects using a systematic approach and noticing patterns in the sequence **Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns**	Partition and regroups whole numbers up to at least 100, using a systematic approach and noticing patterns	Partition and regroup whole numbers up to at least 1000 using a systematic approach and noticing patterns	› multilink cubes to break into groups, bead strings, 10s frames (years 0–1) › an abacus (year 2) › PV blocks, PV money (year 3) › partitioning diagrams, tables for recording patterns
generalise patterns and structures to quantify groups without counting – investigate different ways numbers can be partitioned – explain and justify using vocabulary that identifies quantities when ordering and comparing numbers and patterns (e.g., more than, same as, less than, between) – connect ordinal numbers with the counting sequence	use the mathematical processes to: – connect with algebra number patterns and te reo Māori or other languages with an explicit base 10 number structure – generalise the PV structure to compare and order numbers – investigate different ways numbers can be partitioned and recorded – explain and justify the structure of numbers using PV language		

Phase One Number

Operations

Year 0 - 1	Year 2	Year 3	Teaching Methods/Representations
Use estimation to predict and to check reasonableness of calculations	Use estimation to predict and to check reasonableness of calculations	**Use estimation to predict and to check reasonableness of calculations**	› language for support (e.g., more or less than, close to)
	Identify the nearest 10 to any whole number	**Round whole numbers up to 1000 to the nearest 100 & 10**	› number lines marked with the multiples of 10 or 100, progressing to unmarked number lines › 100s boards (year 2)
Join and separate groups of up to a total of ten objects and find the result by grouping & counting **Join & Separate groups of up to a total of 20 objects and find the difference between groups by grouing and counting**	Add and subtract numbers up to 100 without renaming	**Add & Subtract 2 & 3 digit numbers without renaming and without change unknown**	› discrete materials, number lines (years 0–2) › horizontal and vertical methods (year 3) word problems, equations.
Multiply and divide by making equal groups and using grouping and counting	**Multiply and divide by grouping and skip counting**	**Multiply a 1 or 2 digit number by a 1 digit number without renaming**	› pictures and diagrams (years 1–3) › discrete materials and number lines with grouping (years 1–2) › arrays, PV materials (year 3) word problems, equations.
		divide whole numbers by a 1 digit divisor with no remainders, by grouping and using the inverse relationship with multiplication	› pictures, diagrams, number lines › bar models, multilink cubes word problems, equations.
Use the mathematical processes to: • Connect & Use addition & subtraction in a range of situations • Genaralise the key ideas of counting when quantifying and when finding the toal difference , fair share & comparisons • Investigate word problems & the language used to describe an operations • Explain & justify ways of quantifying, including counting, subatising, grouping & sharing	Use the mathematical processes to: • connect and use addition, subtraction, multiplication, and division in a range of situations • generalise the use of the commutative property when solving addition problems • investigate word problems and identify anoperation to use • explain and justify ways of quantifying,including estimation, groupings, and known efficient methods		

Phase One Number			
Rational Numbers			
Year 0 - 1	**Year 2**	**Year 3**	**Teaching Methods/Representations**
Identify and represent halves and quarters as fractions of sets and regions, using equal parts of a whole.	identify, read, write (using symbols andwords), and represent halves, thirds and quarters as fractions of sets and regions,using equal parts of the whole	**identify, read, write, and represent halves, thirds, quarters, fifths, sixths, and eighths as fractions of sets and regions, using equal parts of the whole**	› a range of continuous materials (bar models) and discrete materials (sets of objects) › words, fraction symbols
	directly compare two fractions involving halves, thirds, and quarters	**compare and order fractions involving halves, quarters, and eighths and identify when two fractions are equivalent**	› a range of continuous materials (bar models, fraction tiles) and discrete materials (sets of objects) words, pictures, symbols, number lines.
	find a half, quarter, or third of a set by identifying groups and patterns (rather than sharing by ones)	**find a unit fraction of a whole**	› discrete materials › bar models (including paper strips) to show a whole and fractions to show partitions (year 3)
	identify, from part of a set or shape, the whole set or shape	identify, from a unit fraction part of a set or amount, the whole set or amount	› discrete materials › bar models (year 3)
		add unit fractions with the same de-nominator	› fraction tiles, paper fraction strips, equations
Use the mathematical processes to: – connect fractions in measurement and geometry situations – investigate practical situations involving sharing, partitioning and identifying fractions – explain and justify ways to equal share.	Use the mathematical processes to: – connect a unit fraction of a quantity to division by a denominator – investigate different ways fractions can be represented and partitioned – explain that in a fraction the denominator indicates the number of parts a whole has been divided into, and the numerator the number of fractional parts		

Phase One Number			
Financial Maths			
Year 0 - 1	**Year 2**	**Year 3**	**Teaching Methods/Representations**
	recognise and order NZ denominations up to $20 according to their value, make groups of ‘like’ denominations, and calculate their value	make amounts of money using one- and two-dollar coins and 5-, 10-, 20-, 50-, and 100-dollar notes	› play money (coins and notes)
	Use the mathematical processes to: – connect to place value – investigate appropriate financial situations.	Use the mathematical processes to: – connect to addition and subtraction when calculating amounts – investigate appropriate financial situations.	› play money (coins and notes).

Phase One Algebra			
Generalising Number Properties			
Year 0 - 1	**Year 2**	**Year 3**	**Teaching Methods/Representations**
identify addition facts up to 10 and their corresponding subtraction facts (families of facts), including doubles and halves	recall addition facts up to 10, and identify addition facts up to 20 and their corresponding subtraction facts (families of facts), including doubles and halves	**recall addition facts up to 20 and their corresponding subtraction facts (families of facts), including doubles and halves**	› materials, including 10s frames and multilink cubes › games
explore adding 0 to or subtracting 0 from a number	explore multiplying a number by 0 and 1 and dividing a number by 1	Explore dividing a number by itself, and why we cannot divide by 0 (e.g., by trying to solve 0 × _ = 5)	› word problems › materials
explore the commutative property of addition (e.g., 5 + 4 = 4 + 5)	identify the commutative property of addition (e.g., 5 + 4 = 4 + 5)	**use the additive identity (e.g., 4 + 0 = 4 and 5 – 0 = 5), multiplicative identity (e.g., 5 × 1 = 5 and 4 ÷ 1 = 4), and commutative property**	› materials, including 10s frames and blocks › the concept of equality (years 1–2) › word problems and materials (year 3) equations,
	identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s	**recall multiplication and corresponding division facts for 2s, 3s, 5s, and 10s**	› 100's boards patterns, choral counting, games and number lines (year 2) › games, families of facts, table grids (year 3)
Use the mathematical processes to investigate the relationship between addition and subtraction	Use the mathematical processes to: – generalise subtraction problems beyond recalled facts by looking for patterns – investigate patterns using choral counting, materials, the recording of multiples, and the relationships between skip counting and multiplication and division facts		

Phase One Algebra

Equations and Relationships

Year 0 - 1	Year 2	Year 3	Teaching Methods/Representations
solve true or false number sentences and open number sentences involving addition and subtraction of 1-digit numbers, using anunderstanding of the equal sign (e.g., 9 – 6 = 8 – _ ; 7 – 5 = 6 – 4 (T or F?)	solve true or false number sentences and open number sentences involving addition and subtraction of 1- and 2-digit numbers, using an understanding of the equal sign (e.g., 18 + _ = 17 + 6; 17 = 25 (T or F?)	**solve true or false number sentences and open number sentences involving addition and subtraction, using an understanding of the equal sign**	› balance scales and discrete materials (year 1) › 10s frames and discrete materials (year 2) › word problems with comparisons (year 3)
copy, continue, create, and describe a repeating pattern with two elements **copy, continue, create, and describe a repeating pattern with three elements, and identify missing elements in a pattern**	**recognise and describe the unit of repeat in a repeating pattern, and use it to predict further elements using the ordinal position**	recognise, continue, and create growing patterns, and describe a rule to explain a pattern	› a range of materials with attributes (e.g., size, colour, texture, shape, movement, sound) › tables (years 2–3) › discrete objects, counters, blocks (year 3)
use the mathematical processes to: – generalise when noticing that repeated patterns constructed in different ways are the same pattern (e.g., ‘red, blue, red, blue’ and ‘hop, jump, hop, jump’ are both ABAB patterns) – investigate repeating patterns in a range of contexts – explain and justify how a pattern is repeating	Use the mathematical processes to: – generalise using the unit of repeat and ordinal position to identify further elements in a pattern – investigate repeating patterns in a range of contexts – explain and justify how a pattern is repeating or growing, and predict future terms in the pattern		

Algorithmic Thinking

sort objects into two groups, following a simple rule	follow a set of instructions to sort numbers or objects according to a simple rule	**follow, and create patterns from, rules or simple algorithms**	› discrete objects (year 1) › drawing and describing a representation of instructions › direction cards to form a sequence › flow diagrams (years 2–3)
	give step-by-step instructions, and identify and correct errors as they are followed	formulate a familiar routine or basic task as a set of precise, step-by-stepinstructions (i.e., an algorithm)	› drawing and describing a representation of instructions › direction cards to form a sequence, sequence steps, flow diagrams

Use the mathematical processes to investigate appropriate situations.

Phase One Measurement

Measuring

Year 0 - 1	Year 2	Year 3	Teaching Methods/Representations
directly compare two objects by an attribute (e.g., length, mass (weight), capacity) **compare the length, mass (weight), temperature, volume, and capacity of objects directly and indirectly (e.g., by comparing each of them with another object and using the object repeatedly)**	**estimate and use an informal unit repeatedly to measure the length, mass (weight), volume, or capacity of an object**	**estimate and then reliably measure length, capacity, and mass (weight), using metric units (e.g., from tools with labelled markings)**	› physical comparisons (years 0–1) › balance scales, a range of capacity containers (years 1–2) › rulers, measuring jugs and containers, scales (year 3)
	compare and order several objects using informal units of length, mass (weight), volume, or capacity	compare and order objects using metric units of length, mass (weight), or capacity	› identical units (e.g., blocks, hands, paper clips, cups (year 2) › metric units on appropriate tools (year 3)
	turn, and describe how far an object or person has turned, using half and quarter turns as benchmarks	**turn, and describe how far an object or person has turned, using half, quarter, and three-quarter turns as benchmarks**	› physical objects › themselves
Use the mathematical processes to: – investigate ways to directly and indirectly compare – explain and justify, using the language of comparison (more, less, longer, shorter, heavier, lighter)	Use the mathematical processes to: – connect to ordering and comparing numbers – investigate a range of practical measurement situations, including ways of measuring by different cultures – explain and justify, using the same informal units when measuring	Use the mathematical processes to: – connect to base 10 place value, ordering and comparing numbers – investigate a range of practical measurement situations, including ways of measuring by different cultures – explain and justify, using the labelled markings on tools	

Phase One Measurement			
Perimeter, area, volume			
Year 0 - 1	**Year 2**	**Year 3**	**Teaching Methods/Representations**
	visualise, estimate, and measure the perimeter and area of 2D shapes, using informal units	**visualise, estimate, and measure:** **– the perimeter of polygons using metric units** **– the area of 2D shapes covered with squares of identical size** **– the volume of rectangular prisms (cuboids) by filling them with identical units**	› 2D shapes as a unit of measure for perimeter (e.g., ice block sticks) (year 2) › informal units for measuring area (e.g., blocks, squares, sticky notes) › square grids and rulers (year 3)
	Use the mathematical processes to: – connect with groupings, addition, and known multiplication facts – investigate practical familiar contexts – explain and justify the importance of using the same unit when measuring		
Time			
connect days of the week to familiar events and daily routines (e.g., the class timetable) identify how the passing of time is measured in years, months, weeks, days, hours,minutes, and seconds › name and order the days of the week, andsequence events in a day using everyday language of time	name and order the months and seasons › describe duration using months, weeks, days, and hours › use a calendar to identify the date and to determine the number of days in each month	use a calendar to work out the number of days, weeks, or months until important events	› pictorial timetables (years 0–1) › cards for ordering days › calendars › the classroom daily timetable
tell the time to the hour using the language of ‘o’clock’	tell the time to the hour and half-hour, using the language of ‘past’ and ‘o’clock’	**tell the time to the hour, half hour, and quarter past and quarter to the hour**	› analogue and digital clocks
Use the mathematical processes to: – connect daily routines and familiar events to days of the week and months of the year – investigate a calendar (its days, weeks, and months) and how long it takes to do tasks (i.e., duration).	Use the mathematical processes to: – connect half past, quarter to, and quarter past to fractions; and daily routines and familiar events to days of the week and months of the year – investigate calendars (their days, weeks, and months).		

Phase One Geometry

Shapes

Year 0 - 1	Year 2	Year 3	Teaching Methods/Representative
identify, sort by one feature, and describe familiar 2D shapes **identify, describe, and classify familiar 2D and 3D shapes presented in different orientations, including triangles, circles, rectangles (including squares), cubes, cylinders, and spheres**	identify, describe, and classify the propertiesof 2D and 3D shapes including ovals, semicircles, polygons (e.g., hexagons, pentagons), rectangular prisms (cuboids), pyramids, hemispheres, and cones, using the properties of shapes	**visualise, identify, compare, and classify 2D and 3D shapes using the properties of shapes including lines of symmetry**	› a range of 2D and 3D shapes › tactile materials › digital tools
		identify right angles in shapes and objects	› 2D and 3D shapes › objects in the environment
Use the mathematical processes to: – connect 2D and 3D shapes in the environment – investigate ways of sorting 2D and 3D shapes into groups – explain, justify, and compare how shapes have been grouped	Use the mathematical processes to: – connect right angles to square corners in shapes and objects – investigate properties of 2D and 3D shapes, including lines of symmetry – explain and justify the classification of shapes into groups based on their properties		

Phase One Geometry

Spatial Reasoning			
Year 0-1	**Year 2**	**Year 3**	**Teaching Methods/Representatives**
compose by trial and error an outlined target shape using smaller shapes, and decompose a shape into smaller shapes **anticipate which smaller shapes might be used to compose a target shape, and then check by making the shape**	anticipate which smaller shapes might be used to compose and decompose a target shape, and then check by making the shape	**compose and decompose 2D shapes using the properties of shapes (e.g., lines of symmetry), other shapes, side lengths, and angles**	› pattern blocks, attribute shapes, paper shapes, play-dough, tangrams › discrete target shapes (year 0) › continuous target shapes (years 1–3)
slide, flip, and turn 2D shapes to make a pattern	recognise lines of symmetry in patterns or pictures, and create or complete symmetrical pictures or patterns	**predict the result of a one-step transformation on 2D shapes**	› 2D shapes, paper folding › mirrors › symmetrical object outlines (discrete and continuous) › painting, art-related tasks › predicting the result of a transformation
use the mathematical processes to: – investigate how shapes can be flipped and turned to make patterns – explain and justify how new shapes can be created, using the names and properties of the shapes and spatial vocabulary	Use the mathematical processes to: – connect quarter, half, and three-quarter turns to fractions – generalise about 2D shapes (e.g., how they can be partitioned into smaller shapes, and how, when orientated in different directions (flip, turn), their properties do not change) – investigate transformation (flip, slide, turn) and lines of symmetry in pictures, patterns, and the environment – explain and justify how shapes have been used to create new shapes		
Pathways			
follow instructions to move to a familiar location or locate an object **follow and give instructions to move to a familiar location or locate an object**	**follow and give instructions to move people or objects to a different location, using direction, distances (e.g., number of steps), and half and quarter turns**	follow and create a sequence of step-by-step instructions (an algorithm) for moving people or objects to a different location	› familiar locations › speaking frames for simple instructions (e.g., sentence starters) › spatial language (to support following and giving instructions) › directions, distance, turns (years 2–3)
use pictures, diagrams, or stories to describe the positions of objects and places	interpret diagrams to describe the positions of objects and places in relation to other objects and places	**interpret, draw, and use simple maps to locate objects and places relative to other objects and places**	› story books, familiar locations › spatial language (to support following and giving instructions) › simple maps › modelling how to draw physical representation of a simple map (year 3)
Use the mathematical processes to: – investigate ways of moving to different locations by following verbal instructions and simple diagrams and maps.			
	Use the mathematical processes to: – connect quarter, half, and three-quarter turns to fractions		

Phase One Statistics

Problem

Year 0 - 1	Year 2	Year 3	Teaching Methods/Representatives
pose summary investigative questions that classify objects or individuals into groups or categories (e.g., colour, brand), and anticipate what the data might show	pose summary investigative questions about a group for which the data will have categorical variables, and anticipate what the data might show (e.g., which outcomes might be more frequent than others)	**pose summary investigative questions about everyday situations, using categorical data and discrete numerical (whole number) data, including about identifying the variable and the group of interest, and anticipate what the data might show**	Support students to pose questions about an area of interest.
use the statistical processes to: – pose summary investigative questions about a group and for which the data will have categorical variables – investigate an area of interest and things students are curious about	use the statistical processes to: – pose an investigative question with support – investigate an area of interest and things students are curious about		

Plan

collect data for one variable by making observations or questioning others, and discuss how the data-gathering process might affect other people	use survey and data-collection questions to collect data, identify who and what the data measures and discuss how the data-gathering process might affect other people **(Time sensitive for year 3)**	Demonstrate data collection methods.
use the statistical processes to: – plan ways of collecting data and survey questions, with support – investigate different survey questions and how they can be interpreted by others		

Data

collect categorical data for one variable	collect categorical data for more than one variable	**collect, record, and sort data, or use secondary data sources provided by someone else**	Represent data using data cards, recording sheets, and tally sheets.
use the statistical processes to: – collect data using data cards, recording, and tally sheets – investigate different ways of collecting data			

Phase One Statistics

Analysis

Year 0 -1	Year 2	Year 3	Teaching Methods/Representatives
create and describe data visualisations (e.g., picture graphs, physical dot plots) for categorical data, giving the frequency for each category	create and describe data visualisations (e.g.,picture graphs, dot plots) for categoricaldata, comparing the frequencies of categories	create and describe data visualisations (e.g., picture graphs, dot plots, bar graphs) for categorical and discrete numerical data	Demonstrate creating data visualisations and describing what a graph shows. Use data cards, picture graphs, frequency tables, and dot plots (years 1–2). Use frequency tables, pictographs, and bar graphs (year 3). Use 'I notice' statements.
		use the statistical processes to: – represent data using data cards, frequency tables, picture graphs, pictographs, dot plots, and bar graphs	

use the statistical processes to:
– investigate how different representations (e.g., a picture graph and dot plot) show the same information
– explain and justify what a graph shows using 'I notice ...' statements

Conclusion

choose statements that best answer the investigative question	**choose statements that best answer the investigative question, reflect on findings, and compare them with anticipated outcomes**	Demonstrate making statements about data visualisations. Show the structure of a comparative statement from data.

use the statistical processes to:
– connect descriptions with data visualisations and analysis questions with features of the visualisations
– investigate ways of reflecting on findings to determine if they make sense with what they already know
– explain why some statements answer the investigative question and some do not

Statistical Literacy

agree or disagree with others' statements about simple data visualisations (e.g., pictographs, physical dot plots).	match statements made by others with features in simple data visualisations, and agree or disagree with the statements.	i**dentify relevant features in others' data visualisations, connect these to descriptive statements, agree or disagree with the statements, and suggest improvements**	Demonstrate making claims about data visualisations, including giving reasons for agreeing or disagreeing with a claim.
		use the statistical processes to explain and justify, using agree-with and disagree-with descriptive statements, and suggest ways to improve.	

Phase One Probability

Probability Investigations

Year 0 - 1	Year 2	Year 3	Teaching Methods/Representations
engage in stories or games that involve chance-based situations and: – decide if something will happen, won't happen, or might happen – identify possible and impossible outcomes (e.g., what might happen next)	engage in chance-based investigations about games and everyday situations to: – identify possible outcomes – collect and record data – create visualisations for frequencies of outcomes (e.g., lists, picture, graphs) – describe what these data visualisations show – answer chance-based investigative questions – notice variations in outcomes (e.g., how often each of the numbers on a dice come up)	**engage in chance-based investigations about games and everyday situations to:** **– anticipate what might happen** **– identify possible outcomes** **– collect and record data** **– create data visualisations for frequencies of possible outcomes** **– describe what these visualisations show** **– answer investigative questions** **– reflect on anticipated outcomes** **– notice variations in outcomes**	Play games of chance using physical objects (e.g., dice, coins, spinners, pulling things out of a hat). Create tables for frequencies, lists, and outcomes. Represent probability using materials, dice, coins, spinners, and items in a bag. Represent outcomes using drawings, tally charts, lists, and tables.

Critical Thinking in Probability

	agree or disagree with the statements made by others about chance situations	explain and question statements about chance-based situations, with reference to data	Demonstrate making claims about data visualisations, including giving reasons for agreeing or disagreeing with a claim.

use the statistical processes to:
– connect relative frequency in words (e.g., two out of three) to fractions (e.g., 2/3)
– investigate games of chance and list possible outcomes
– use the statistical enquiry cycle (PPDAC) for chance-based investigations
– explain, justify, and use the language of probability (impossible, unlikely, possible, likely, certain) and its ordering from impossible to certain.