

Number: *Students use numbers and operations and the relationships between them efficiently and flexibly.*

Pre-school	K1	K2	Grade 1
1. Understand whole numbers and decimals:			
<p>Numbers are used for quantities:</p> <ul style="list-style-type: none"> • Connect many kinds/quantities of concrete objects and actions to numbers. <p>Numbers to 5 with a focus on representing quantities using concrete objects.</p> <ul style="list-style-type: none"> • Listen to and say the names of numbers in meaningful contexts. 	<p>Numbers are used for quantities:</p> <ul style="list-style-type: none"> • quantities • order <p>An awareness of numbers to 20 with a focus on collections to 10.</p> <ul style="list-style-type: none"> • write to 10 • recognise to 20 • verbally count in sequences to 10 and beyond • develop an awareness of numbers and their uses • recognize and use different ways to represent numbers • count objects with 1 to 1 correspondences • connects number names, quantities, and written numerals <p>Uses for money:</p> <ul style="list-style-type: none"> • Money is used to buy things in play situations and in real life. 	<p>Numbers are used for quantities, labels and order:</p> <ul style="list-style-type: none"> • quantities • labels • order <p>Numbers to 100 with a focus on collections to 10.</p> <ul style="list-style-type: none"> • focus on counting numbers to 10 and 20 • recognise and write some numbers to at least ten. <p>Make and count small collections:</p> <ul style="list-style-type: none"> • subitising ('seeing' without counting) small collections using concrete materials • collections can be counted and the total can be recorded • strategies to count each object once and only once • the order in which objects are counted does not affect how many there are • the last number said describes how many and not the last object. <p>Uses for money:</p> <ul style="list-style-type: none"> • money is used to buy things or pay for services. <p>Collections can be made up of smaller collections.</p> <p>Match one-to-one to compare</p> <ul style="list-style-type: none"> • compare two collections, one to one 	<p>Numbers are used for quantities, labels and order:</p> <ul style="list-style-type: none"> • ordinal numbers indicate position in a sequence <p>Numbers into the hundreds with a focus on collections to 20:</p> <ul style="list-style-type: none"> • read, write and say numbers using the patterns that occur through the decades • the order of the digits makes a difference to the quantity a number represents <p>Strategies to count collections:</p> <ul style="list-style-type: none"> • recognise collections of numbers in a familiar arrangement • counting skills to work out how many in a collection of concrete materials • counting does not always begin at one • count forwards and backwards in ones from any number • the arrangement of the collection does not affect the quantity. <p>Read and make amounts of money using simple combinations of coins:</p> <ul style="list-style-type: none"> • identify different value of coins • identify different money amounts • make and record small amounts with different combinations of coins . <p>Decompose collections into parts up to 20:</p> <ul style="list-style-type: none"> • materials to decompose small numbers into parts <p>Compare and order small numbers using materials:</p> <ul style="list-style-type: none"> • use materials to compare and order
2. Understand fractions:			
	<p>Objects, collections or quantities can be shared:</p> <ul style="list-style-type: none"> • an awareness of fractions in everyday use 	<p>Objects, collections or quantities can be shared:</p> <ul style="list-style-type: none"> • the language of fractions in everyday use • share an object or a collection of objects • share a collection by dealing or counting out an equal number of items or portions for each recipient 	<p>Share objects, collections and quantities into equal parts and use the words 'whole' and 'half' appropriately:</p> <ul style="list-style-type: none"> • sharing an object means dividing it into equal parts • objects shared into two portions create halves • sharing something equally into more parts means the parts become smaller.
3. Understand operations			
<p>Represent self-generated or orally presented number stories involving addition and subtraction of very small numbers using materials, drawing a picture or acting out:</p>		<p>Represent self-generated or orally presented number stories involving addition and subtraction of very small numbers using materials, drawing a picture or acting out:</p> <ul style="list-style-type: none"> • number stories can be represented using materials, by 	<p>Understand number stories involving change, combine and compare situations by using materials, drawing a picture or acting out:</p> <ul style="list-style-type: none"> • number stories can be represented in materials, pictures, symbols, numbers and by visualisation and think boards

<p>Informal exposure to number stories through action songs, rhymes and counting games.</p>		<p>drawing a picture, by acting out and/or in literature</p> <p>Visualise small collections as groupings of other collections:</p> <ul style="list-style-type: none"> • manipulate objects into small groups <p>Represent self-generated or orally presented number stories involving equal groups and sharing with very small numbers using materials, drawing a picture or acting out:</p> <ul style="list-style-type: none"> • model situations involving addition of repeated equal quantities and sharing using small quantities • share and group objects evenly 	<ul style="list-style-type: none"> • addition and subtraction can be described using everyday language • addition can be used in situations where a quantity is changed by adding to it and/or where two quantities are combined • subtraction can be used in situations where a quantity is changed by taking from it • symbols (+, -) are used to represent the operations of addition and subtraction, including situations involving repeated quantities <p>Represent change (join and separate) situations with number sentences to match the semantic structure (meaning) of the problem:</p> <ul style="list-style-type: none"> • connect addition and subtraction problems and the symbolic representations of them • write addition and subtraction number sentences to match the meaning of the problem • when combining two or more collections, counting on from the higher number gives the same result as starting with the smaller number or from the beginning. <p>Visualise self-generated or orally presented number stories involving very small numbers:</p> <ul style="list-style-type: none"> • represent a story with objects <p>Visualise small numbers as groupings of other numbers:</p> <ul style="list-style-type: none"> • find number combinations that make a quantity • the part-part-whole notion of numbers, using concrete materials <p>Represent number stories involving equal groups and sharing situations by using materials, drawing a picture or acting out:</p> <ul style="list-style-type: none"> • multiplication can be used for situations involving repeating equal quantities • division can be used for situations involving sharing an object or a collection <p>Visualise equal groups within a small collection:</p> <ul style="list-style-type: none"> • use materials to show equal-sized groups that make a quantity • equal-sized groups are found in everyday situations
4. Calculate			
		<p>Solve simple number stories by mentally counting and subitising:</p> <ul style="list-style-type: none"> • solve simple number stories by subitising, acting out, using concrete materials or by drawing a picture • solve simple addition and subtraction number stories by counting in their 'mind's eye' <p>Solve simple number stories using materials and</p>	<p>Strategies to mentally add and subtract small numbers generated from stories:</p> <ul style="list-style-type: none"> • basic addition facts to ten • mentally add and subtract small numbers generated from stories <p>Strategies to solve addition and subtraction problems using materials and diagrams:</p>

		<p>drawings:solve using:</p> <ul style="list-style-type: none"> • subitising • acting out • using concrete materials • drawing a picture. <p>Calculators are tools:</p> <ul style="list-style-type: none"> • calculators are tools for exploring numbers and number patterns • calculators have number keys and function keys. 	<ul style="list-style-type: none"> • solve and record using: <ul style="list-style-type: none"> - acting out - materials - counting strategies (refer to Understand Number) - a number line to count forwards and backwards - diagrams - words and/or symbols - a calculator • use patterns of combining and separating (part-part-whole notion of number) collections up to 10 • partition numbers to suit the problem <p>Solve multiplication and division problems using materials and diagrams:</p> <ul style="list-style-type: none"> • solve simple division problems by sharing amounts into equal groups • solve simple division problems by arranging collections into equal groups <p>Use a calculator to count:</p> <ul style="list-style-type: none"> • numbers are entered into a calculator by pressing digits from left to right as you read them • calculators have keys for the four operations • use the 'constant function' on a calculator to solve repeated addition or subtraction problems.
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Working Mathematically: *Students use mathematical thinking processes and skills in interpreting and dealing with mathematical and non-mathematical situations.*

Pre-school	K1	K2	Grade 1
1. Mathematical strategies:			
	Explores simple strategies to problems	<ul style="list-style-type: none"> • Questions to ask to continue a hands-on activity • Posing questions to find out about things Strategies that could be used for representing and solving problems, such as: • acting out • touching each object as they count • counting in their 'mind's eye' • one-to-one comparison to decide which collection is bigger • dealing out for sharing problems • drawing a picture 	<ul style="list-style-type: none"> • Asking simple mathematical questions • Their own mathematical questions can be answered (and suggesting how, when prompted) Strategies that could be used for representing and solving problems, such as: • acting out • using concrete materials • using a number line to count forwards and backwards • drawing a picture • writing words and/or symbols • visualising • playing musical chairs
2. Apply and verify:			
		<ul style="list-style-type: none"> • Self-correction when counting (modelling and scaffolding may be required). • Responding to questions about why a particular approach was taken. 	<ul style="list-style-type: none"> • Ways to make simple self-corrections • Responding to questions about why a particular approach was taken
3. Reason Mathematically:			
<ul style="list-style-type: none"> • Explore shapes and numbers in the environment around them • Recognition of pattern and repetition. • Things can be found that are the same as, or different from, other things 	<ul style="list-style-type: none"> • Recognition of pattern and repetition • Things can be found that are the same as, or different from, other things 	<ul style="list-style-type: none"> • Identify numbers, shapes and measurements around them. • Trial using different things during play and activities. • Predictions about what will happen next. • If something did not work as expected, we can look for reasons why. • Recognition of simple relationships • Recognition of pattern and repetition. • Things can be found that are the same as, or different from, other things • Differences and similarities between familiar events and times . 	<ul style="list-style-type: none"> • Numbers, shapes and measurements around them • At least one trial is needed to test conjectures, and a testing method needs to be chosen • Trials are not always successful. • Recognition of simple relationships • Recognition of pattern and repetition • Things can be alike or different

Pre-algebra and Algebra: *Students use algebraic symbols, diagrams and graphs to understand, to describe and to reason.*

Pre-school	K1	K2	Grade 1
1. Functions: Understand Graphs			
2. Represent Variation			
3. Expressing Generality			
<p>Man-made and natural patterns:</p> <ul style="list-style-type: none"> • explore patterns in pictures, on their clothes, in the environment. <p>Recognition of simple repeating patterns:</p> <ul style="list-style-type: none"> • reproduce patterns with two elements e.g. rhythm patterns, art activities, beading, etc 	<p>Man-made and natural patterns:</p> <ul style="list-style-type: none"> • patterns are found in everyday objects <p>Everyday language of pattern:</p> <ul style="list-style-type: none"> • use basic language to talk about patterns <p>Recognition of simple repeating patterns:</p> <ul style="list-style-type: none"> • patterns can be copied, continued and created • recognize • use 2D shapes to make patterns 	<p>Man-made and natural patterns:</p> <ul style="list-style-type: none"> • patterns are found in everyday objects <p>Everyday language of pattern:</p> <ul style="list-style-type: none"> • language to talk about patterns in everyday objects or patterns created or copied • language to talk about patterns in everyday events <p>Recognition of simple repeating patterns:</p> <ul style="list-style-type: none"> • patterns can be copied, continued and created • recognize • use 2D shapes to make patterns <p>Patterns in the counting numbers:</p> <ul style="list-style-type: none"> • copy and continue the pattern of the counting numbers 	<p>Patterns occur in everyday situations:</p> <ul style="list-style-type: none"> • regularities in everyday life assist in 'knowing what to do' at various times and what we can do in the future <p>Description of simple patterns:</p> <ul style="list-style-type: none"> • simple language to describe patterns <p>Identification of simple repeating patterns:</p> <ul style="list-style-type: none"> • patterns can be copied, continued and created • describe and compare two versions of the same pattern • describe the repeating elements in simple spatial arrangements • identify the elements of a repeating pattern and when the cycle repeats <p>Simple whole number patterns:</p> <ul style="list-style-type: none"> • straightforward counting and repeating patterns based on whole numbers • calculators can be used to investigate number patterns <p>Representation of simple repeating patterns using numbers:</p> <ul style="list-style-type: none"> • represent repeating patterns in number terms and use a number term to make patterns with materials

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4. Equivalence, Equations and Inequalities

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Measurement: *Students use direct and indirect measurement and estimation skills to describe, compare, evaluate, plan and construct.*

1. Understand Units			
Pre-school	K1	K2	Grade 1

<p>Comparative language for common attributes:</p> <ul style="list-style-type: none"> order objects by size and make comparisons according to their attributes e.g. small, medium, large 	<p>Comparative language for common attributes:</p> <ul style="list-style-type: none"> Distinguish and describe size attributes, including length, weight, and capacity or volume; compare objects according to various size attributes. 	<p>Comparative language for common attributes:</p> <ul style="list-style-type: none"> use and respond to language associated with the attributes of length use and respond to the comparative language of: <ul style="list-style-type: none"> length capacity mass time <p>Choose units to match the attribute to be 'measured':</p> <ul style="list-style-type: none"> some objects/events are better to use as units than others things are measured for a purpose <p>Count non-standard units to say how many 'fit'</p>	<p>Language and choice of attributes for length, area, mass, capacity and time to make simple comparisons:</p> <ul style="list-style-type: none"> use and respond to the appropriate language of length, capacity, mass and time use and respond to the comparative language of: <ul style="list-style-type: none"> length capacity mass time <p>Choose units to match the attribute to be 'measured':</p> <ul style="list-style-type: none"> some objects/events are better to use as units than others use uniform units <p>Count non-standard units to say how many 'fit'</p>
2. Direct Measure			
<p>Time is measured: An awareness of different times of the day for different activities.</p>	<p>Directly compare length, and time:</p> <ul style="list-style-type: none"> compare everyday objects by their attributes <p>Time is measured:</p> <ul style="list-style-type: none"> an awareness of different times of the day for different activities name and order the days of the week 	<p>Directly compare length, mass, capacity, time and area:</p> <ul style="list-style-type: none"> direct comparison of objects or events gives information about their size or time strategies to directly compare objects and events by different attributes: <ul style="list-style-type: none"> length mass capacity time area Identify and sort objects according to comparative language objects and events can be described and ordered by how much they have of a particular attribute <p>Time is measured:</p> <ul style="list-style-type: none"> particular things happen at particular times clocks are used to tell the time and the hands move or digits change as time passes the name and order of the days of the week. 	<p>Directly compare length, mass, capacity, time and area, ordering lengths and events in time:</p> <ul style="list-style-type: none"> use the same units when comparing objects or events strategies to directly compare objects and events by different attributes: <ul style="list-style-type: none"> length, width, height by lining up one end mass by hefting time by starting at the same time area by placing one region over the other focus on the attributes of length, mass, capacity and time to solve simple comparison problems and compare familiar events into typical sequences <p>Indirectly compare length, using a go between and no units:</p> <ul style="list-style-type: none"> when objects cannot be compared directly, a 'go-between' can be used to compare them <p>Read key times on clocks and use calendars:</p> <ul style="list-style-type: none"> use regularly occurring things as cues to the time of year read key times the name and order of the months of the year and the seasons that relate to them use calendars to identify specific information about days and dates the name and order of the months of the year and the seasons that relate to them use calendars to identify specific information about days and dates
3. Indirect Measure: Measure Relationships			
4. Indirect measure: Scale			
5. Indirect Measure: Estimate			

		Everyday language of approximation when judging size: <ul style="list-style-type: none">• everyday language associated with approximation• make size judgements in everyday situations:	Estimate and compare to make judgements about length: <ul style="list-style-type: none">• everyday language associated with approximation• estimate length by look• find things that are clearly bigger or smaller than the object
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Pre-school	K1	K2	Grade 1
1. Understand Chance			
		<p>Informal language of chance in conversation:</p> <ul style="list-style-type: none"> informal language of chance in everyday conversations <p>Elements of chance in familiar activities:</p> <ul style="list-style-type: none"> there is an element of chance involved in familiar activities the outcome of a chance event is uncertain identify possible outcomes of familiar events in their lives 	<p>Familiar language of chance:</p> <ul style="list-style-type: none"> familiar language of chance <p>Elements of chance in everyday events:</p> <ul style="list-style-type: none"> familiar activities have an element of chance chance events can have many outcomes knowing the possible outcomes of daily events helps to predict a future outcome
2. Collect and organize data			
<p>Classify everyday objects:</p> <ul style="list-style-type: none"> everyday objects can be sorted and classified by different attributes such as size, shape, colour 	<p>Pose questions about objects or pictures:</p> <ul style="list-style-type: none"> collect and represent data in a variety of ways focusing on concrete and pictorial representations <p>Classify everyday objects:</p> <ul style="list-style-type: none"> everyday objects can be sorted and classified by different attributes such as size, shape, colour 	<p>Pose questions about objects or pictures:</p> <ul style="list-style-type: none"> pose questions about objects or pictures to find out information pose questions to find out about someone <p>Classify everyday objects:</p> <ul style="list-style-type: none"> everyday objects can be sorted and classified by different attributes such as size, shape, colour language to describe the similarity or difference between several things 	<p>Pose data-orientated questions:</p> <ul style="list-style-type: none"> ways to pose data-oriented questions <p>Simple data collection:</p> <ul style="list-style-type: none"> data can be collected by counting things or observing use a variety of ways to record data as it is being collected <p>Classify data by groups:</p> <ul style="list-style-type: none"> classifying items into categories requires the naming of each group properties of groupings help to predict where a new object could be best placed data can be represented in different ways
3. Summarise and represent data			
<p>Physical grouping of objects to represent data:</p> <ul style="list-style-type: none"> Contribute info for a simple picture graph as modelled and led by teacher. 	<p>Physical grouping of objects to represent data:</p> <ul style="list-style-type: none"> represent data using concrete objects, pictures, drawings and symbols represent the collected data with one-to-one correspondence of objects and pictures 	<p>Physical grouping of objects to represent data:</p> <ul style="list-style-type: none"> represent data using concrete objects, pictures, drawings and symbols represent the collected data with one-to-one correspondence of objects and pictures 	<p>Summarise data by simple counts:</p> <ul style="list-style-type: none"> summarise data by making simple counts compare the size of classified groups using one-to-one correspondence. <p>Display data in a variety of formats using real objects or pictures:</p> <ul style="list-style-type: none"> data may be organised and displayed in a variety of ways represent the collected data with one-to-one correspondence of objects and pictures
4. Interpret data			

		<p>Interpret class pictorial data displays:</p> <ul style="list-style-type: none"> • reach conclusions from displays of class data • use a fold line to make symmetrical pictures 	<p>Read and interpret simple data displays:</p> <ul style="list-style-type: none"> • ask focus questions to assist with description and interpretation of data • read, interpret and describe (more, less, fewer, greater than, less than) simple data collection displays • draw conclusions, based on counting the data and one-to-one correspondence
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Chance & Data: *Students use their knowledge of chance and data handling processes in dealing with data and with situations in which uncertainty is involved.*

Space: *Students describe and analyse mathematically the spatial features of objects, environments and movements.*

Pre-school	K1	K2	Grade 1
1. Represent Location			
<p>Everyday language of position, orientation and direction:</p> <ul style="list-style-type: none"> • the language of position, orientation and direction <p>Representation of position: location of key areas within the classroom and school</p> <p>explore the position and location of objects, such as putting together puzzles and block structures</p>	<p>Everyday language of position, orientation and direction:</p> <ul style="list-style-type: none"> • the language of position, orientation and direction • use the language of position, direction and orientation to: <ul style="list-style-type: none"> - give and follow directions based on position - move to illustrate the meaning of words <p>Representation of position:</p> <ul style="list-style-type: none"> • location of key areas within the classroom and school • use position and location of objects for putting together puzzles and creating block structures 	<p>Everyday language of position, orientation and direction:</p> <ul style="list-style-type: none"> • the language of position, orientation and direction • use the language of position, direction and orientation to: <ul style="list-style-type: none"> - give and follow directions based on position - move to illustrate the meaning of words <p>Representation of position:</p> <ul style="list-style-type: none"> • location of key areas within the classroom and school • draw pictures or make things that illustrate the meaning of words relating to position and orientation • materials and objects can be arranged in many different ways • paths exist in their environment 	<p>Language of position, orientation and direction:</p> <ul style="list-style-type: none"> • the language of position, orientation and direction • use the language of position, direction and orientation to: <ul style="list-style-type: none"> *follow and give directions) *find an object *to follow a path <p>Informal maps:</p> <ul style="list-style-type: none"> • informal maps can be drawn by placing things from the environment in order (as they appear) and by illustrating the meaning of • materials and objects can be arranged in many different ways • paths can be followed in and around their environment
2. Represent Shape			
<p>Language of shapes: use introductory language related basic shapes (square, circle, triangle, rectangle)</p> <p>Identification and representation of shapes in the environment:</p> <ul style="list-style-type: none"> • common shapes exist within the environment • explore the use of shapes to make pictures and models 	<p>Language of shapes:</p> <ul style="list-style-type: none"> • Recognize and describe basic 2-dimensional geometric shapes <p>Identification and representation of shapes in the environment:</p> <ul style="list-style-type: none"> • common shapes exist within the environment • objects in the environment can be represented with materials or by drawing • draw or use cut-outs of a variety of 2D shapes to represent objects in the environment 	<p>Language of shapes:</p> <ul style="list-style-type: none"> • use language related to shapes <p>Identification and representation of shapes in the environment:</p> <ul style="list-style-type: none"> • common shapes exist within the environment • investigate shape of objects to determine uses • objects in the environment can be represented with materials or by drawing • draw or use cut-outs of a variety of 2D shapes to represent objects in the environment • draw shapes using spatial and directional language 	<p>Language of shapes and their attributes:</p> <ul style="list-style-type: none"> • use language to describe shapes and attributes of shapes • shapes and objects can be sorted according to familiar attributes, similarities and differences can be discussed <p>2D shapes in 3D objects:</p> <ul style="list-style-type: none"> • 3D objects contain 2D shapes within them • investigate the 2D surface shapes of solid objects to determine suitability <p>Simple drawings and representations of shapes:</p> <ul style="list-style-type: none"> • recognise the features of 2D shapes and represent them when drawing • investigate 2D shapes to determine suitability

			<ul style="list-style-type: none"> • objects in the environment can be represented with materials or by drawing • parts of shapes or objects that exist are not always visible in drawings or photographs • draw an object from an oral description that involves spatial language
3. Represent transformations			
	<p>Simple symmetrical patterns:</p> <ul style="list-style-type: none"> • introduce language of symmetry 	<p>Reorientation of shapes to match or fit:</p> <ul style="list-style-type: none"> • language of movement in dance, drama, play and with objects • strategies to match shapes directly, fit shapes together • strategies to place pictures and shapes where outlines are provided to enable direct matching <p>Simple symmetrical patterns:</p> <ul style="list-style-type: none"> • language of symmetry • confirm the symmetry of common 2D shapes • use a fold line to make symmetrical pictures and patterns 	<p>Pictures and patterns with shapes:</p> <ul style="list-style-type: none"> • language to describe movement • two figures are the same if one fits on the other exactly <p>make pictures and patterns</p> <p>Creation of simple shape patterns:</p> <ul style="list-style-type: none"> • repetitive patterns and arrangements can be copied using multiple copies of shapes or by repeating shapes • complete patterns by directly matching component parts • the effect of spatial changes can be predicted without having to actually carry out the change • multiple copies of shapes (triangles, rectangles and squares) can fit together to create pattern with no gaps <p>Simple symmetrical patterns:</p> <ul style="list-style-type: none"> • use language of symmetry • identify symmetry in a variety of 2D shapes and designs • make symmetrical patterns, pictures and pictures combined with symmetrical patterns
4. Reason geometrically			
	<p>Classification of everyday objects:</p> <ul style="list-style-type: none"> • Everyday objects can be sorted and classified by different attributes (colour, shape, size) 	<p>Everyday language of shape:</p> <ul style="list-style-type: none"> • use the names of common 2D shapes and everyday language to describe the properties of common shapes in the environment 	<p>Everyday language of shape, movement and function:</p> <ul style="list-style-type: none"> • use the names of common 2D shapes and 3D objects and everyday language to describe the shape, movement and function of things <p>Classification using simple criteria:</p> <ul style="list-style-type: none"> • to distinguish between shapes that are alike and those that are different • name and recognise rectangular boxes, cylinders, cones and spheres in common things • strategies for sorting and classifying shapes according to chosen or given criteria in a consistent way • similarities and differences between things that can be seen or handled <p>Shape, movement and function of familiar objects:</p> <ul style="list-style-type: none"> • familiar objects can be classified using simple criteria related to shape, movement or function

Number: *Students use numbers and operations and the relationships between them efficiently and flexibly.*

1. Understand whole numbers and decimals:			
Grade 2	Grade 3	Grade 4	Grade 5
<p>Numbers are used for quantities, labels and order:</p> <ul style="list-style-type: none"> • use, read and write ordinal numbers to indicate position in a sequence . <p>Numbers into the hundreds with a focus on collections to 20 and beyond:</p> <ul style="list-style-type: none"> • investigate patterns • digit positions in numbers defines the quantity <p>Strategies to count collections, including skip counting:</p> <ul style="list-style-type: none"> • recognise collections of numbers in a familiar arrangement • make or draw collections of a given size into the hundreds • skip count in multiples of two, five and ten to make counting more efficient • count forwards and backwards in ones from any number • rearranging collections to make them easier to count does not affect the quantity . <p>Read, make and write small amounts of money using simple combinations of coins and notes:</p> <ul style="list-style-type: none"> • count money and record the amount. <p>Decompose small numbers into parts including standard place value partitions:</p> <ul style="list-style-type: none"> • use materials to decompose numbers into standard place value partitioning <p>Compare and order small numbers with and without materials:</p> <ul style="list-style-type: none"> • classify numbers as odd or even • place numbers on a number line, including simple number lines where some numbers are missing • order numbers • make a given number smaller or larger by 1 or by 10 . 	<p>Numbers are used for quantities, labels and order:</p> <ul style="list-style-type: none"> • use ordinal numbers to indicate position in a sequence <p>Numbers up to 1 000 with a focus on quantities to 100:</p> <ul style="list-style-type: none"> • patterns in the 1-100 sequence are repeated within each hundred and the pattern extends beyond a hundred and into the thousands • digit positions in numbers defines the quantity <p>Strategies to count larger collections:</p> <ul style="list-style-type: none"> • make or draw collections of a given size into the hundreds • skip count in multiples of two, five and ten to make counting more efficient • count forwards and backwards in multiples of two, five and ten from any number • rearranging collections to make them easier to count does not affect the quantity <p>Count, read and write amounts of money using coins and notes:</p> <ul style="list-style-type: none"> • read amounts of money written with a decimal point separating the dollars from the parts of a dollar <p>Decompose two and three-digit numbers in different ways, including standard place value:</p> <ul style="list-style-type: none"> • decompose whole numbers into two or more other numbers <p>Compare and order numbers with and without materials:</p> <ul style="list-style-type: none"> • classify numbers as odd or even • place numbers, including zero, on a number line and explain the reason for the number placement • use place value to explain why one number is larger or smaller than another • make a given number smaller or larger by 1, by 10 or by 100 	<p>Numbers to ten thousand:</p> <ul style="list-style-type: none"> • read, write and say whole numbers up to ten thousand, leaving a space between each set of three digits from right to left • to order and locate numbers on a number line • represent whole numbers in various ways • the name and value of places in numbers up to ten thousand • the properties and patterns of odd and even numbers <p>Money and measures using a decimal point:</p> <ul style="list-style-type: none"> • money amounts with a decimal point between the whole number (dollar) part and the fractional (cents) part • write money with only one symbol • identify the whole part and the fractional part in measurements <p>Standard and non-standard partitions of two-digit and three-digit numbers:</p> <ul style="list-style-type: none"> • that numbers can be partitioned in standard ways or non-standard ways <p>Compare and order numbers to ten thousand:</p> <ul style="list-style-type: none"> • order numbers using place value • the relative size of numbers • count forwards and backwards in tenths from any number, including amounts of money • rounding up and down to the nearest 10 or 100 for practical purposes • different ways of counting a collection 	<p>Numbers to hundreds of thousands and decimal numbers to hundredths:</p> <ul style="list-style-type: none"> • represent whole numbers and decimal fractions in various ways • the name and value of places in numbers up to hundreds of thousands and decimals up to two decimal places • identify factors and multiples of some two and three-digit numbers • patterns in the multiples of numbers • count in tenths and hundredths for money and measures recognise different representations of numbers involving decimal fractions* <p>Amounts of money and measures using a decimal point:</p> <ul style="list-style-type: none"> • interpret a calculator display involving money round money to the nearest 5c • identify the whole part and the fractional part in measurements <p>Standard and non-standard place-value partitions of numbers into the thousands:</p> <ul style="list-style-type: none"> • that numbers can be partitioned in standard ways and non-standard ways <p>Compare and order numbers to hundreds of thousands, including money and measures:</p> <ul style="list-style-type: none"> • use place value to compare and order numbers • the relative size of larger numbers • count forwards and backwards in tens, hundreds and thousands from any number • rounding up and down to the nearest 100, 1 000 or 10th for practical purposes.
2. Understand fractions:			
<p>Share objects, collections and quantities into equal parts and use the words 'whole', 'half' and</p>	<p>Share objects, collections and quantities into equal parts and use the language of unit</p>	<p>Partition objects, collections and quantities into equal parts and read, write and count with unit</p>	<p>Simple fraction equivalences and comparisons using a range of models, including number lines:</p>

<p>'quarter' appropriately:</p> <ul style="list-style-type: none"> • when the parts are put back together they make the whole quantity and it is called 'one') • recognise and represent halves and quarters using: <ul style="list-style-type: none"> - collections - partitions of whole objects . 	<p>fractions:</p> <ul style="list-style-type: none"> • recognise and represent halves and quarters using collections • share quantities by cutting, folding, pouring or weighing to make equal shares 	<p>fractions:</p> <ul style="list-style-type: none"> • to represent common fractions orally, in drawings, models and in written forms • partition an object or collection into equal parts recognise simple equivalences of fractions through diagrams and models • use terminology of unit fractions in context half of a half is one-quarter • order unit fractions using diagrams and models 	<ul style="list-style-type: none"> • read, write and say unit fractions using drawings, oral and written forms, in everyday contexts • partition an object or collection in a variety of ways to show equal parts • recognise simple equivalences of fractions to tenths through diagrams and models • that parts of a whole can look different but still be equal in size • count in fractional amounts • order unit fractions using diagrams, number lines and models
3. Understand operations			
<p>Represent number stories involving change, combine and compare situations by using materials, drawing a picture or acting out, and using addition and subtraction number sentences:</p> <ul style="list-style-type: none"> • language used to describe addition and subtraction) • addition can be used in situations where a quantity is changed by adding to it and/or where two quantities are combined • subtraction can be used in situations where a quantity is changed by taking from it and/or to find the difference between two quantities • symbols (+, -) are used to represent the operations of addition and subtraction, including situations involving repeated quantities • addition can be performed in any order • subtraction cannot be 'turned around' <p>Match the semantics of addition and subtraction problem types with the numbers and symbols in number sentences, identifying the unknown:</p> <ul style="list-style-type: none"> • connect addition and subtraction problems and the symbolic representations of them) • say or write sensible addition and subtraction story problems to match given number sentences • when combining two or more collections, counting on from the higher number gives the same result as starting with the smaller number or from the beginning • skip count by 2s, 5s and 10s to show how skip counting relates to multiplication <p>Identify the whole amount and the parts within number stories:</p>	<p>Represent number stories involving change, combine and compare situations by using diagrams and addition and subtraction number sentences:</p> <ul style="list-style-type: none"> • interpret different addition and subtraction situations and select an appropriate operation • addition can be used in situations where a quantity is changed by adding to it and/or where two quantities are combined* • subtraction can be used in situations where a quantity is changed by taking from it and/or where two quantities are separated • addition can be performed in any order • be 'turned around' <p>Match the semantics of addition and subtraction problem types with the numbers and symbols in number sentences, identifying the unknown:</p> <ul style="list-style-type: none"> • write sensible addition and subtraction story problems to match given number sentences • skip count by 2s, 5s and 10s, use technology and materials to support skip counting by other numbers and show how skip counting relates to multiplication <p>Use the whole amount and the parts within number stories to write and link addition and subtraction number sentences for small quantities:</p> <ul style="list-style-type: none"> • equalising collections or finding the difference between quantities can be done by addition or subtraction <p>Identify the whole amount and the parts within numbers to 20 and write addition and subtraction number sentences:</p> <ul style="list-style-type: none"> • combine numbers or amounts or objects to 	<p>Represent number stories involving change, combine and compare situations, using diagrams and addition and subtraction number sentences:</p> <ul style="list-style-type: none"> • write number sentences using the terms change, combine and compare • write number stories to match given number sentences write <p>(meaning) of addition and subtraction problem types with the numbers and symbols in their number sentences, identifying the unknowns. Use the whole amount and the parts within number stories and in open number sentences to link and choose between addition and subtraction for two and three-digit numbers:</p> <ul style="list-style-type: none"> • state subtraction facts from known addition facts • solve missing number problems • work out the unknown <p>Represent number stories involving equal groups, sharing, simple rates, arrays, combinations and ratio comparison using materials, drawing a picture or acting out, and using addition, subtraction, multiplication and division number sentences:</p> <ul style="list-style-type: none"> • multiplication can be used for: <ul style="list-style-type: none"> - repeating equal quantities - arrays - simple combination problems • division can be used for sharing or partitioning a collection, quantity or object <p>Match the semantics of multiplication and division problem types with the numbers and symbols in number sentences, identifying the unknowns:</p> <ul style="list-style-type: none"> • select appropriate operations for number 	<p>Represent the full range of additive problems using diagrams as needed and addition and subtraction number sentences (equations) identifying the part or the whole as the unknown:</p> <ul style="list-style-type: none"> • write number sentences • write number stories to match given number sentences write <p>relationship between addition and subtraction for large whole numbers, money and familiar measures:</p> <ul style="list-style-type: none"> • use the inverse relationship to restate the problem* • use the inverse relationship for calculator work to find missing numbers <p>Represent the full range of multiplicative problems using diagrams as needed and multiplication and division number sentences (equations):</p> <ul style="list-style-type: none"> • multiplication can be used for: <ul style="list-style-type: none"> -repeating equal quantities -rates -arrays -simple combination problems • division can be used for: <ul style="list-style-type: none"> -arrays <p>Match the semantics of multiplication and division problem types with the numbers and symbols in number sentences, identifying the unknowns:</p> <ul style="list-style-type: none"> • select appropriate operations for number sentences <p>Use the size of the groups, the number of groups and the whole amount within number stories, and in open number sentences, to link and choose between multiplication and division for whole numbers:</p>

<ul style="list-style-type: none"> combine numbers of objects to make a quantity 'part-part-whole' diagrams to make the link between the direct meaning of an addition/subtraction word problem with the 'transformed' number sentence subtraction is the inverse of addition <p>Represent number stories involving equal groups or sharing situations by using materials, drawing a picture, acting out and using addition or subtraction number sentences:</p> <ul style="list-style-type: none"> multiplication of objects can be described using everyday language multiplication can be used for situations involving repeating equal quantities division can be used for situations involving sharing an object or a group of objects some collections of objects can be shared evenly and some collections have objects left over symbols (\times, \div) are used to represent the operations of multiplication and division. <p>Visualise self-generated or orally presented number stories involving equal groups of very small numbers:</p> <ul style="list-style-type: none"> use materials to show equal-sized groups that make a quantity . <p>Visualise small numbers as equal groupings of other numbers:</p> <ul style="list-style-type: none"> use objects, drawings to form small equal-sized groups 	<ul style="list-style-type: none"> make a quantity 'part-part-whole' diagrams to make the link between the direct meaning of an addition/subtraction word problem with the 'transformed' number sentence <i>worked out using</i> subtraction is the inverse of addition <p>Represent number stories involving equal groups, sharing, very simple rates, arrays or combinations by using materials, drawing a picture or acting out, and using addition, subtraction, multiplication or division number sentences:</p> <ul style="list-style-type: none"> multiplication and division of objects can be described using everyday language multiplication can be used for situations involving repeating equal quantities division can be used for situations involving sharing or partitioning a collection, quantity or object collections of objects can be shared evenly and some collections have objects left over <p>Represent equal group situations with number sentences to match the semantic structure of the problem:</p> <ul style="list-style-type: none"> symbols (\times, \div) are used to represent the operations of multiplication and division write sensible multiplication and division story problems to match given number sentences* <p>Identify the size of the groups, the number of groups and the whole amount in the number stories and represent in simple arrays:</p> <ul style="list-style-type: none"> use the rows and columns in arrays to represent the number of groups and the number of objects in each group <p>Identify different equal groupings within small numbers and represent as arrays:</p> <ul style="list-style-type: none"> collections may be arranged into equal-sized groups 	<p>sentences</p> <p>Use the size of the groups, the number of groups and the whole amount within number stories to write and link multiplication and division number sentences for small quantities:</p> <ul style="list-style-type: none"> remainders in division can be left or shared into parts of a whole the numbers in a multiplication can refer to the number of groups or the number of objects in each the inverse relationship use the inverse relationship to solve missing number problems <p>Identify different equal groupings within whole numbers and represent as arrays and multiplication and division number sentences:</p> <ul style="list-style-type: none"> multiplication can be performed in any order, without altering the answer collections may be arranged into equal sized groups identify 'multiples', 'products' and 'factors' 	<ul style="list-style-type: none"> remainders in division can be left or shared into parts of a whole the inverse relationship use the inverse relationship to solve missing number problems identify 'prime' numbers and determine that they have exactly two factors
<p>4. Calculate</p>			
<p>Strategies to mentally add and subtract small numbers and remember some basic addition facts to 20:</p> <ul style="list-style-type: none"> basic addition facts to 20 mentally add and subtract using a variety of strategies such as: -doubles and near doubles 	<p>Strategies to mentally add and subtract to 100, drawing on remembered addition facts to 20:</p> <ul style="list-style-type: none"> draw on remembered basic facts to 20 to find addition facts to 100* mentally add and subtract using a variety of strategies such as: -doubles and near doubles 	<p>Strategies to mentally add and subtract to 100, drawing on remembered facts:</p> <ul style="list-style-type: none"> change a subtraction into an addition extend basic addition and subtraction facts using patterns use standard partitioning use doubles and near doubles 	<p>Strategies to mentally add and subtract numbers to 100 and extension of remembered addition facts into the hundreds:</p> <ul style="list-style-type: none"> change a subtraction into an addition bridge the tens' use standard partitioning and non-standard partitioning

<p>- imagining a number line adding in any order *add on to the larger number *counting forwards and backwards in tens . Strategies to add and subtract two-digit numbers using materials, diagrams and informal paper-and-pencil methods:</p> <ul style="list-style-type: none"> • solve and record using: -acting out -materials (counters, buttons, popsticks, blocks) -counting strategies -a number line to count forwards and backwards -diagrams -words and/or symbols -a calculator -place value • partition numbers to suit the problem <p>Solve multiplication and division problems using materials and diagrams</p> <ul style="list-style-type: none"> • multiplication facts for two times (doubles) up to 2 x 10 • model and solve simple division problems by sharing amounts into equal groups) • solve simple multiplication problems by arranging collections into equal groups. <p>Use a calculator to add and subtract:</p> <ul style="list-style-type: none"> • numbers are entered into a calculator by pressing digits from left to right as you read them • calculators have keys for the four operations • use the 'constant function' on a calculator to solve repeated addition or subtraction problems. <p>Check calculations for obvious errors:</p> <ul style="list-style-type: none"> • use a number line to identify whether numbers are close to or far away from a particular number • use the size of a known group to estimate the size of an unknown group • use the properties of operations to check calculations 	<p>-change subtraction to addition -partition numbers -imagine a number line and begin adding from the largest number -count forwards and backwards in tens -simple extensions of basic facts -use the commutative property of addition to aid the recall of basic addition facts</p> <ul style="list-style-type: none"> • use known addition facts to work out subtraction facts • use known facts to work out unknown facts* • number facts can be applied to any situation <p>Informal paper-and-pencil methods, based on partitioning, to add and subtract two-digit numbers:</p> <ul style="list-style-type: none"> • explain, discuss and compare methods for solving addition and subtraction problems • choose between mental and written methods • partition numbers to suit the problem <p>Solve multiplication and division problems using diagrams:</p> <ul style="list-style-type: none"> • multiplication facts for two times (doubles) up to 2 x 10 • model, solve and record multiplication and division problems using single-digit divisors • explain, discuss and compare methods for solving multiplication and division problem. <p>Use a calculator to add and subtract:</p> <ul style="list-style-type: none"> • addition problems can be entered into a calculator in a different order and still have the same result • subtraction problems must be entered into a calculator in the correct order • use the 'constant function' on a calculator to solve repeated addition or subtraction problems • calculators can assist in the exploration and development of mental computation strategies and for single operations involving two-digit and three-digit numbers <p>Use simple approximations to check calculations:</p> <ul style="list-style-type: none"> • use benchmarks on a number line to estimate where other numbers would be 	<ul style="list-style-type: none"> • rearrange the order to use compatible numbers • take some from one number to give to another • change the numbers by adding or subtracting the same amount • start with the biggest place (front loading) • use known addition and subtraction facts to work out those they do know • adding in tens to solve <p>Strategies to mentally multiply and divide single digit numbers and remember some multiplication facts:</p> <ul style="list-style-type: none"> • observe patterns in multiplication tables • make links between the tables <p>Use counting by unit fractions to mentally add and subtract orally presented fractions with like denominators:</p> <ul style="list-style-type: none"> • count forwards or backwards <p>Add and subtract whole numbers into the 100s and money using their own and pencil methods:</p> <ul style="list-style-type: none"> • informal paper-and-pencil methods when problems go beyond mental calculation capabilities • everyday language to explain strategies used to solve a problem or number sentence problem or number sentence • use standard partitioning to add and subtract two-digit whole numbers without regrouping <p>Informal written strategies to multiply and divide, interpreting remainders appropriately:</p> <ul style="list-style-type: none"> • factorise numbers and represent them in different ways • express the 'left over' after a division as a remainder <p>Use a calculator for all four operations:</p> <ul style="list-style-type: none"> • the efficiency of using the x key instead of repeated addition, and the ÷ key instead of repeated subtraction on a calculator • multiplication can be entered on a calculator in a different order and still have the same result • division must be entered on a calculator in the correct order. <p>Use number lines and rounding to check calculations:</p> <ul style="list-style-type: none"> • check a calculation by doing it in a different way • estimate and approximate the answers • round numbers (up or down depending upon the context) to the nearest 10 to approximate calculations 	<ul style="list-style-type: none"> • extend basic addition and subtraction facts using patterns • use doubles and near doubles • rearrange the order to use compatible numbers • take some from one number to give to another • change the numbers by adding or subtracting the same amount • start with the biggest place (front loading) • use known addition and subtraction facts to work out those they do know • adding in tens, twenties and thirties, hundreds etc from any starting point <p>Strategies to mentally multiply and divide single digit numbers and remember most multiplication facts:</p> <ul style="list-style-type: none"> • change a division into a multiplication • make links between the tables • use known multiplication facts to work out unknown multiplication facts • multiply and divide numbers by 10 and 100 and display changes using models such as place value charts <p>Use counting by unit fractions to mentally add and subtract orally presented fractions with like denominators:</p> <ul style="list-style-type: none"> • count forwards or backwards • use number lines, arrays and fraction walls to perform mental calculations with common fractions <p>Add and subtract whole numbers into the 100s, money and simple measures using their own and pencil methods and informal written methods for readily visualised fractions:</p> <ul style="list-style-type: none"> • informal and formal paper-and-pencil strategies • when problems go beyond mental calculation capabilities • everyday language to explain strategies used to solve a problem or number sentence problem or number sentence • use standard partitioning, into the hundreds, to add and subtract two-digit whole numbers with and without regrouping <p>Informal written strategies to multiply and divide, interpreting remainders appropriately:</p> <ul style="list-style-type: none"> • factorise numbers and represent them in different ways • express the remainder after division as a remainder or a fraction
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		<ul style="list-style-type: none"> • use the properties of operations to check calculations • check the accuracy of results against the context of the problem 	<p>interpret remainders in the context of the question</p> <p>Use a calculator for all four operations:</p> <ul style="list-style-type: none"> • use a calculator for whole and decimal numbers, where numbers go beyond mental capabilities • calculators are the sensible choice for laborious or repetitive computations. <p>Use appropriate strategies to check calculations:</p> <ul style="list-style-type: none"> • check a calculation by doing it in a different way • estimate and approximate the answers • round numbers (up or down depending upon the context) to the nearest 5, 10 or 100 to approximate calculations • use the properties of operations to check calculations • check the accuracy of results against the context of the problem
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Working Mathematically: *Students use mathematical thinking processes and skills in interpreting and dealing with mathematical and non-mathematical situations.*

1. Mathematical strategies:			
Grade 2	Grade 3	Grade 4	Grade 5
<ul style="list-style-type: none"> • Asking simple mathematical questions prompted by similar or related questions • Asking and responding to questions related to quantity • Identifying the relevant mathematics in problems, how to describe it and express it in ways that assist with solution • Clarifying problem situations and investigations by describing interpretations of them in their own words. • Interpretation of different representations of problem situations and investigations • Describing number sentences, describing them in their own words <p>Strategies that could be used for representing and solving problems, such as:</p> <ul style="list-style-type: none"> • using concrete materials • using a number line to count forwards and backwards • drawing diagrams • writing words and/or symbol 	<ul style="list-style-type: none"> • Asking simple mathematical questions prompted by similar or related questions • Identifying the relevant mathematics in problems, how to describe it and express it in ways that assist with solution • Clarifying problem situations and investigations by describing interpretations of them in their own words. • Interpretation of different representations of problem situations and investigations and pose related questions • Interpretation of number sentences, describing them in their own words • Interpretation of problem situations and expression of them mathematically by drawing simple diagrams, writing number sentences, making sets of things, lists, tables, geometric constructions and by using concrete materials that assist with the solution <p>Strategies that could be used for representing problems mathematically, and solving them, such as:</p>	<ul style="list-style-type: none"> • Recognition of connections between mathematical ideas and use of this knowledge to describe situations more simply, to break tasks down into more manageable steps, or to restate problems in their own words. • Description of the structure of a problem, nominate other problems that have the same structure and explain why they are the same • Interpreting and explaining a range of mathematical symbols associated with equality and with simple inequalities • Creating mathematical situations or posing questions that match given number sentences write number sentences to match given problems and pose similar questions of their own. • Representing problem situations and investigations with appropriate materials and their use to justify their findings • Choosing and applying strategies suited to the mathematical structure of various problems and investigations 	<ul style="list-style-type: none"> • Recognition of connections between mathematical ideas and use of this knowledge to describe situations more simply, to break tasks down into more manageable steps, or to restate problems in their own words • Description of the structure of a problem, nominate other problems that have the same structure and explain why they are the same • Interpreting and explaining a range of mathematical symbols associated with equality • Creating mathematical situations or posing questions that match given number sentences), write number sentences to match given problems and pose similar questions of their own. • Representing problem situations and investigations with appropriate materials and their use to justify their findings • Choosing and applying strategies suited to the mathematical structure of various problems and investigations), and use of this knowledge to pose related problems

<ul style="list-style-type: none"> • visualising 	<ul style="list-style-type: none"> • using concrete materials • drawing diagrams • writing number sentences • making sets of things • making lists and tables • geometric constructions • guessing and checking • solving a simpler problem 		
Apply and verify:			
<ul style="list-style-type: none"> • Strategies to check solutions • Explaining why a particular approach has been taken when responding to a mathematical question 	<ul style="list-style-type: none"> • Checking of reasoning and work by ensuring the reasonableness of the results with respect to the original problem • Explaining why a particular approach has been taken when responding to a mathematical question 	<ul style="list-style-type: none"> • Explanation of reasoning and the sequence of steps used to interpret and solve problems, and explanation of how results have been checked 	<ul style="list-style-type: none"> • Explanation of reasoning and the sequence of steps used to interpret and solve problems, and explanation of how results have been checked
Reason Mathematically:			

<ul style="list-style-type: none"> • Numbers, shapes and measurements around them • Testing of conjectures, and choice of methods of testing them • Recognition of simple relationships • Trials are not always successful. • Recognition and description of simple relationships and change. Things can be alike or different • Simple strategies such as recognition of similarity, difference and repetition, to identify and describe regularity and pattern 	<ul style="list-style-type: none"> • Numbers, shapes and measurements around them • Analysis of simple mathematical statements, and choice of methods of testing them including the use of technology • Simple predictions or conjectures, including making them, thinking them through and choosing ways to test them, and attempting to convince themselves and others about whether they are true • Recognition and description of simple relationships and change • Simple strategies such as recognition of similarity, difference and repetition, to identify and describe regularity and pattern 	<ul style="list-style-type: none"> • Ways that self, friends and family use ideas about space, number, measurement and chance every day. • Making and testing statements about relationships, using technology as appropriate, and explanation of why they are true or false or whether more examples need to be investigated to make a decision • Making and testing simple conjecture), and explanation of the approach taken and the conclusions reached • Description of approaches used successfully within mathematical situations and comparison of these with other effective approaches • Generalisation about mathematical situations with respect to key attributes and explanation of how the generalisation was reached • Using different strategies, such as looking for consistent change, to identify and generalise about regularity and pattern • Communicating ideas, suggestions and findings to others using informal reports, concrete materials, technology, diagrams and graphs. 	<ul style="list-style-type: none"> • Ways that self, friends and family use ideas about space, number, measurement and chance every day. • Making and testing statements about relationships, using technology as appropriate, and explanation of why they are true or false or whether more examples need to be investigated to make a decision • Making and testing simple conjectures and explanation of the approach taken and the conclusions reached • Description of approaches used successfully within mathematical situations and comparison of these with other effective approaches • Generalisation about mathematical situations with respect to key attributes and explanation of how the generalisation was reached • Using different strategies, such as looking for consistent change, to identify and generalise about regularity and pattern • Communicating ideas, suggestions and findings to others using informal reports, concrete materials, technology, diagrams and graphs
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Pre-algebra and Algebra: *Students use algebraic symbols, diagrams and graphs to understand, to describe and to reason.*

1. Functions: Understand Graphs			
Grade 2	Grade 3	Grade 4	Grade 5
		Conventions of graphing: <ul style="list-style-type: none"> • use number lines that start at zero (non-negative numbers) with units that are evenly spaced • how to show pattern • construct simple block, bar and picture graphs for collections of things using a one-to-one correspondence • graph numerical information without a rule Understand graphs: <ul style="list-style-type: none"> • ways to collect and record data: <ul style="list-style-type: none"> - in non-numerical categories - in numerical ways • strategies to interpret and describe patterns in graphs • use lists, tables and graphs to represent and analyse change • use graphs to communicate findings of investigations 	Conventions of graphing: <ul style="list-style-type: none"> • use number lines that start at zero (non-negative numbers) with units that are evenly spaced • how to show pattern • how to label axes when graphing • construct simple block, bar and picture graphs where one unit may represent more than one object • graph numerical information without a rule Understand graphs: <ul style="list-style-type: none"> • ways to collect and record data: <ul style="list-style-type: none"> - in non-numerical categories - in numerical ways • strategies to interpret and describe patterns in graphs • use lists, tables and graphs to represent, analyse and predict change • use graphs to communicate findings of investigations
1. Represent Variation			
		Types of change: <ul style="list-style-type: none"> • collections can be grouped according to the same and different qualities • be aware of consistent change in familiar situations • a rule may be found in an unchanging situation Representing relationships: <ul style="list-style-type: none"> • read tables that show how two quantities vary in a constant way • relationships occur between variables 	Types of change: <ul style="list-style-type: none"> • collections can be grouped according to the same and different qualities • the difference between consistent change • a rule may be found in an unchanging situation Representing relationships: <ul style="list-style-type: none"> • read tables that show how two quantities vary in a constant way* • relationships occur between variables
2. Expressing Generality			
Patterns occur in everyday situations: <ul style="list-style-type: none"> • in everyday life assist in 'knowing what to do' at various times and what we can do in the future Description of simple pattern rules: <ul style="list-style-type: none"> • simple language to describe patterns that have been observed, created or produced • describe a constant addition rule Identification and continuation of repeating	Patterns occur in everyday situations: <ul style="list-style-type: none"> • pattern refers to ongoing regularity or repetition in a situation and can be used to predict the next element Description of simple pattern rules: <ul style="list-style-type: none"> • language to discuss patterns that have been observed, created or produced • describe a constant addition rule Identification and continuation of repeating	Recognising and describing patterns: <ul style="list-style-type: none"> • patterns exist in nature, number sequences and number charts • the difference between growing and repeating patterns of objects or drawings • ways to describe addition and subtraction patterns • ways to describe multiplication patterns • write patterns of numbers for objects or drawings to help explore simple relationships 	Recognising and describing patterns: <ul style="list-style-type: none"> • patterns exist in nature and number sequences and can be used to make predictions • the difference between growing and repeating patterns of objects or drawings • ways to describe addition and subtraction number sequences • ways to describe and extend multiplication and division number sequences

<p>patterns</p> <ul style="list-style-type: none"> • patterns can be copied, continued and created • repeat or continue a pattern in a different medium and compare • describe repetitive patterns of multiple copies of shapes that have been transformed with a flip, slide or turn • identify the elements of a repeating pattern and when the cycle repeats • analyse (identify the cycle and elements) and make general statements about patterns • create and follow sequences of actions and instructions <p>Simple whole number patterns:</p> <ul style="list-style-type: none"> • straightforward counting and repeating patterns based on whole numbers • patterns which occur in odd and even numbers • calculators can be used to investigate number patterns <p>Representation of repeating patterns using numbers:</p> <ul style="list-style-type: none"> • representing repeated patterns with numbers can help identify and continue patterns • establish simple correspondence between sets • record data in tables and on graphs noticing simple relationships and making appropriate comments 	<p>patterns:</p> <ul style="list-style-type: none"> • patterns can be copied, continued and created • repeat or continue and compare a pattern in a different medium • analyse spatial arrangements and patterns and describe the repeating elements or changes between elements • identify the elements of a repeating pattern and when the cycle repeats • identify the elements of a repeating pattern and when the cycle repeats • analyse, describe and create simple patterns and make general statements and predictions about them <p>Whole number patterns:</p> <ul style="list-style-type: none"> • patterns in the numeration system including: <ul style="list-style-type: none"> -counting patterns -patterns in a hundred chart -repeating patterns -patterns in addition tables • patterns which occur in odd and even numbers • calculators can be used to investigate number patterns <p>Representation of repeating patterns using numbers:</p> <ul style="list-style-type: none"> • representing situations with numbers can help identify and continue patterns • analyse and continue number sequences and generalise about changes between elements • establish simple correspondence between sets • record data in tables and on graphs noticing simple relationships and making appropriate comments* 	<ul style="list-style-type: none"> • use materials to represent number and spatial patterns • specify elements in a sequence or pattern in terms of their position <p>Rules and patterns in number relationships:</p> <ul style="list-style-type: none"> • patterns exist in the number system • follow simple rules to complete addition and subtraction number sequences <p>Patterns in operations:</p> <ul style="list-style-type: none"> • generalise using the inverse properties of multiplication and division • generalise using the commutative properties of addition and multiplication • apply the associative property of addition • apply the distributive property of multiplication <p>Properties of operations to aid simple mental calculations:</p> <ul style="list-style-type: none"> • use known facts to extend calculations • simplify, but maintain equivalence, to enable mental computation • use the constant function to reproduce and extend a pattern in the multiples of numbers 	<ul style="list-style-type: none"> • write patterns of numbers for objects or drawings to help explore simple relationships • use materials to represent number and spatial patterns • specify elements in a sequence or pattern in terms of their position <p>Rules and patterns in number relationships:</p> <ul style="list-style-type: none"> • use patterns in numbers to assist with computation • follow simple rules to complete addition and subtraction number sequences <p>Patterns in operations:</p> <ul style="list-style-type: none"> • generalise using the inverse properties of multiplication and division • generalise using the commutative properties of addition and multiplication • apply the associative properties of addition and multiplication • apply the distributive property of multiplication* <p>Properties of operations to aid simple mental calculations:</p> <ul style="list-style-type: none"> • use known facts to extend calculations • simplify, but maintain equivalence, to enable mental computation • use the constant function to reproduce and extend a pattern
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3. Equivalence, Equations and Inequalities

<p>Simple statements of equivalence:</p> <ul style="list-style-type: none"> • make two quantities equivalent using materials and objects • explore situations using inverse operations: • use visual images to identify and describe some attributes of equivalence in measurement and spatial situations • the notion of commutativity for addition • strategies to find unknown quantities in addition and subtraction number sentences • express simple number relationships in their own words 	<p>Simple statements of equivalence:</p> <ul style="list-style-type: none"> • make two quantities equivalent by adding on • explore situations where inverse operations can be applied and describe how inverse relationships apply to other situations and problems • use materials such as arrays or balances to identify and describe equivalence in number situations • use visual images to identify and describe some attributes of equivalence in measurement and spatial situations • the notion of commutativity for addition 	<p>Writing and exploring equations:</p> <ul style="list-style-type: none"> • write equations to match equivalence statements • use the symbols = and \neq appropriately • equality of groups can be expressed as 'is the same as' • use materials to explore and show equivalence <p>Represent and solve simple equations:</p> <ul style="list-style-type: none"> • represent and solve simple equations for problem-solving and finding the unknown • use the equals sign to show equality between simple addition and subtraction statements • interpret arrays and write equations that match them 	<p>Writing and exploring equations:</p> <ul style="list-style-type: none"> • write equations to match equivalence statements • symbols < and > can be used to show inequality • the equal sign means 'is the same as', rather than an indication to perform an operation • use materials to explore and show equivalence <p>Represent and solve simple equations:</p> <ul style="list-style-type: none"> • represent and solve simple equations for problem-solving and finding the unknown • specified numbers to generate equations which satisfy numerical constraints • use the equals sign to show equality between
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<ul style="list-style-type: none"> • to interpret and describe number sentences 	<ul style="list-style-type: none"> • strategies to find unknown quantities in addition and subtraction number sentences • express simple number relationships in their own words • how to write simple statements of equivalence using addition and subtraction symbols • to interpret and describe number sentences 	<ul style="list-style-type: none"> • use patterns to find the missing number in an addition or subtraction number sentence • use problem-solving strategies to find the unknown • write and solve equations using inverse relationships and properties of operations 	<ul style="list-style-type: none"> statements for all four operations • interpret arrays and write equations that match them • use patterns to find the missing number in a multiplication or division number sentence • use problem-solving strategies to find the unknown • write and solve equations using inverse relationships and properties of operations
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Measurement: *Students use direct and indirect measurement and estimation skills to describe, compare, evaluate, plan and construct.*

Understand Units			
Grade 2	Grade 3	Grade 4	Grade 5
<p>Language and choice of attributes for length, capacity, mass, time and area to compare and order:</p> <ul style="list-style-type: none"> • use and respond to the appropriate language of length, capacity, mass, time and area • use and respond to the comparative language of: <ul style="list-style-type: none"> -length -capacity -mass -area -time • the difference between length and area <p>Choose units appropriate to the attribute to be 'measured' and use uniform units for length and capacity:</p> <ul style="list-style-type: none"> • choose an appropriate unit that relates well to the attribute to be measured • use uniform units • careful measurement of the same object a number of times with the same unit will give the same answer • repeat a single unit to measure <p>Non-standard units are used to measure length, mass and capacity:</p> <ul style="list-style-type: none"> • non-standard units can be used to measure: <ul style="list-style-type: none"> how long how heavy how much something holds 	<p>Language and choice of attributes for length, capacity, mass, time and area to compare and order:</p> <ul style="list-style-type: none"> • use and respond to the appropriate language of length • use and respond to the comparative language of: <ul style="list-style-type: none"> -length -capacity -mass -area -time • the difference between length and area <p>Choose uniform units that relate well to the attribute to be 'measured':</p> <ul style="list-style-type: none"> • choose an appropriate unit that relates well to the attribute to be measured • use uniform units • careful and consistent use of the unit chosen to ensure accuracy • strategies to deal with part units for length, mass, capacity and time described • repeat a single unit to measure • the size of something does not change when a different-sized unit is used to measure it, but the number of units taken to match it may change. <p>Non-standard units can be used to measure and compare length, capacity, mass, time and area:</p> <p>non-standard units can be used to measure:</p> <ul style="list-style-type: none"> -length -capacity -mass -time 	<p>Language and choice of attributes for length (including perimeter), capacity, mass, time, area and angle to compare and order:</p> <ul style="list-style-type: none"> • use and respond to the comparative language of: <ul style="list-style-type: none"> -length -capacity -mass -area -time -angle • appropriate attributes to solve problems or compare objects <p>Choose uniform units for the attribute to be measured and common units when comparing:</p> <ul style="list-style-type: none"> • appropriate units for the attribute to be measured • units must be uniform and there must be no gaps or overlaps <p>Non-standard units can be used to measure and compare length (including perimeter), capacity, mass, time, area and angle:</p> <ul style="list-style-type: none"> • measure in non-standard units <p>Standard units are used to record and communicate measurements:</p> <ul style="list-style-type: none"> • standard units are used to record and communicate measurements: <ul style="list-style-type: none"> -length (centimetres, metres) -capacity (millilitres, litres) -mass (grams, kilograms) -angle (degrees) -time (minutes, hours, days, weeks, months, years) <p>The relationship between the names of metric units and their size:</p>	<p>Language and choice of attributes for length, capacity, mass, time, area, angle and volume to compare and order:</p> <ul style="list-style-type: none"> • use and respond to the comparative language of: <ul style="list-style-type: none"> -volume -temperature • appropriate attributes to solve problems or compare objects <p>The smaller the size of the unit the more accurate the measurement:</p> <ul style="list-style-type: none"> • appropriate selection of units to measure length, temperature, area, time, capacity, mass and angles • identify the degree of precision required for the context • units must be uniform and there must be no gaps or overlaps <p>Non-standard units can be used to measure and compare length, capacity, mass, time, area, angle and volume:</p> <ul style="list-style-type: none"> • measure in non-standard units <p>Choose appropriately between standard and non-standard units:</p> <ul style="list-style-type: none"> • standard units are used to record and communicate measurements: <ul style="list-style-type: none"> -length (centimetres, metres) -capacity (millilitres, litres) -mass (grams, kilograms) -angle (degrees) -time (minutes, hours, days, weeks, months, years). <p>The connections between metric prefixes and place value:</p>

	<p>-area</p> <p>Standard units are used to record and communicate measurements:</p> <ul style="list-style-type: none"> • standard units remain constant and are readily recognised and understood 	<ul style="list-style-type: none"> • the names of metric units relate to their size: <ul style="list-style-type: none"> *kilo means a thousand *centi means one hundredth *milli means one thousandth 	<ul style="list-style-type: none"> • common metric prefixes and their meanings <p>Conversions of common metric measures</p> <ul style="list-style-type: none"> • conversions between various metric units
Direct Measure			
<p>Directly compare and order length, mass, capacity, time and area:</p> <ul style="list-style-type: none"> • use the same units when comparing objects or events • strategies to directly compare objects and events by different attributes: <ul style="list-style-type: none"> -length, width, height by lining up one end -mass by hefting or placing the objects in either side of a balance scale -capacity by pouring -time by starting at the same time -area by placing one region over the other • the same object can be ordered differently according to different attributes • focus on the attributes of length, mass, capacity and time to solve simple comparison problems • order and compare time <p>Indirectly compare length, capacity, mass, time and area (non-numerically):</p> <ul style="list-style-type: none"> • use indirect methods to compare objects by: <ul style="list-style-type: none"> -length -capacity -mass -time -area <p>Use rulers, read key times on clocks and read and use calendars:</p> <ul style="list-style-type: none"> • use centimetres to measure length • use balance scales to compare mass • use regularly occurring things to measure time • read the time • use calendars to identify specific information about days and dates 	<p>Directly compare and order length, mass, capacity, time and area:</p> <ul style="list-style-type: none"> • use the same units when comparing objects or events • strategies to directly compare objects and events by different attributes: <ul style="list-style-type: none"> -length, width, height by lining up one end -mass by hefting or placing the objects in either side of a balance scale -capacity by pouring -time by starting at the same time -area by placing one region over the other -the same objects can be ordered differently according to different attributes • standard (metre, centimetre, litre, kilogram) or non-standard units can be used for comparison of objects/events • order and compare time and familiar events <p>Indirectly compare length, capacity, mass, time and area (non-numerically):</p> <ul style="list-style-type: none"> • use indirect methods to compare objects by: <ul style="list-style-type: none"> -length -capacity -mass -time -area <p>Make and use whole number calibrated scales for length, mass, volume and time, including reading clocks, calendars and rulers:</p> <ul style="list-style-type: none"> • choose and use the appropriate instrument to measure different lengths • choose and use appropriate instruments to measure and compare the mass of objects • use a calibrated jug to compare the volume of other containers • read o'clock, half and quarter hour times on a range of analogue clocks and read the time on digital clocks • use calendars to identify specific information about days and dates 	<p>Directly compare and order length, mass, capacity, time, area and angle:</p> <ul style="list-style-type: none"> • strategies to directly compare objects and events by different attributes: <ul style="list-style-type: none"> -length, width, height by making measurements with a tape measure, metric rule, trundle wheel -mass by hefting or placing the objects in either side of a balance scale or onto kitchen/bathroom scales -capacity by pouring -time by starting at the same time -area by placing one region over the other -angle by using corners of books or bent pipe cleaners or straws to find angles around the room with similar angles. <p>Indirectly compare length, capacity, mass, time, area and angle (non-numerically):</p> <ul style="list-style-type: none"> • use indirect methods to compare objects by: <ul style="list-style-type: none"> -length -capacity -mass -time -area -angle <p>Make and use whole number calibrated scales for length, area, capacity, mass, time and angle:</p> <ul style="list-style-type: none"> • measuring devices can be made by repeating a unit • instruments have calibrations marked on them • appropriate instruments for measuring • measure and make lengths in centimetres and metres for practical purposes • area is a measurement of surface taken up by a shape and can be measured by counting shares within a shape, superimposing or by counting arbitrary units • measure the area of regular and irregular shapes • measure the volume of rectangular prisms • measure volume for liquids (capacity) in millilitres (mL) and litres (L) • measure mass in grams and kilograms • superimpose to compare the size of angles 	<p>Directly compare and order length, mass, capacity, time, area and angle:</p> <ul style="list-style-type: none"> • strategies to directly compare objects and events by different attributes: <ul style="list-style-type: none"> -length, width, height by making measurements with a tape measure, metric rule, trundle wheel -mass by hefting or placing the objects in either side of a balance scale or on kitchen/bathroom scales -capacity by filling containers -time by starting at the same time -area by placing one region over the other -angle by using corners of books or bent pipe cleaners or straws to find angles around the room with similar angles <p>Indirectly compare length (including perimeter), capacity, mass, time, area, angle and volume (non-numerically):</p> <ul style="list-style-type: none"> • use indirect methods to compare objects by: <ul style="list-style-type: none"> -perimeter -volume <p>Make and use whole number calibrated scales for length, area, capacity, mass, time and angle:</p> <ul style="list-style-type: none"> • measuring devices can be made by repeating a unit • instruments have calibrations marked on them for measuring length, mass, capacity and time • appropriate instruments for the required level of accuracy to measure length, capacity, mass and time • measure and make lengths in millimetres, centimetres and metres • practical activities to measure area using grids of square units, A4 sheets of paper, square metres and square centimetres • measure the area of regular and irregular shapes • measure the volume of rectangular prisms and the cubic units used to measure them • measure and compare volumes of liquids using appropriate instruments and the units of millilitres and litres • measure, compare and order the mass of different

		<ul style="list-style-type: none"> • measure an angle with a self-made protractor • measure time using standard measures • read digital clocks, and the time on analogue clocks to the hour, half-hour and quarter-hour • interpret basic calendars by locating specific days, dates and events • arrange recorded measurements in increasing and decreasing order of magnitudes 	<p>objects using appropriate instruments and the units of grams and kilograms</p> <ul style="list-style-type: none"> • superimpose to compare the size of angles • use a protractor to measure and compare angles to the nearest 10° • use a thermometer to measure air temperature • measure time using standard measures • read digital clocks, and the time on analogue clocks to tell the time to the nearest minute and recognise equivalent forms of saying and recording the time • interpret and use a range of calendars and timetables, including digital and electronic, and timelines to locate specific information • arrange recorded measurements in increasing and decreasing order of magnitudes
1. Indirect Measure: Measure Relationships			
<p>Find the area of squares and rectangles using the array structure</p> <ul style="list-style-type: none"> • use arrays to find area 	<p>Practical measuring of perimeters:</p> <ul style="list-style-type: none"> • practical measuring of perimeters <p>Find the area of squares and rectangles using the array structure:</p> <ul style="list-style-type: none"> • use arrays to find area <p>Find the volume of rectangular prisms by using and counting cubes:</p> <ul style="list-style-type: none"> • find the volume of a rectangular prism without counting all of the squares 	<p>The connection between direct measure and indirect measure of perimeters:</p> <ul style="list-style-type: none"> • indirectly measure the perimeter of regular and irregular shapes <p>Area of squares and rectangles using the array structure and informal square units:</p> <ul style="list-style-type: none"> • area of a rectangle <p>Find the volume of rectangular prisms using cubes and their own methods of counting</p> <p>Calculate elapsed times in quarter hours:</p> <ul style="list-style-type: none"> • calculate elapsed time in quarter hours <p>Ways to calculate one measurement from another using operations:</p> <ul style="list-style-type: none"> • ways to calculate one measurement from another using operations 	<p>Shortcuts to finding perimeter:</p> <ul style="list-style-type: none"> • measure the perimeter of polygons and identify special cases where shortcuts can be used <p>The array structure and multiplication to measure area:</p> <ul style="list-style-type: none"> • area of a regular polygons <p>Find the volume of rectangular prisms using cubes and their own methods of counting:</p> <ul style="list-style-type: none"> • find the volume of rectangular prisms by counting the number of cubes in one layer and the number of layers • rearranging the placement of cubes in an object does not change the volume. <p>Estimate and calculate time durations using clocks, daily schedules, timetables and calendars:</p> <ul style="list-style-type: none"> • calculate durations of specific events including those lasting minutes, hours, days, weeks, months and years <p>Estimate a measurement that cannot be measured directly with the given measuring tools:</p> <ul style="list-style-type: none"> • ways to calculate one measurement from another using operations
2. Indirect measure: Scale			
	Size relationships between real objects and	Size relationships between the original and	Size and distance relationships to make models,

	<p>models:</p> <ul style="list-style-type: none"> • simple comparisons of the size of models to real objects 	<p>models, maps and plans:</p> <ul style="list-style-type: none"> • maps and plans are used to represent situations in a reduced or enlarged way • enlarging or reducing changes size but not shape • strategies to reduce or enlarge simple 2D figures • consider scale when producing drawings or models 	<p>maps and plans 'look right':</p> <ul style="list-style-type: none"> • use a sense of proportion when producing drawings or models • enlarging or reducing changes size but not shape • strategies to reduce or enlarge 2D figures • strategies to reduce or enlarge simple 3D models
<p>3. Indirect Measure: Estimate</p>			
<p>Estimate length using non-standard units:</p> <ul style="list-style-type: none"> • estimate length by look • make reasonable estimates of length up to about five or six units, using units that can be seen or handled <p>Estimate and compare length, mass and capacity:</p> <ul style="list-style-type: none"> • compare quantities of length, area and capacity by looking 	<p>Estimate length and capacity using non-standard units:</p> <ul style="list-style-type: none"> • estimate capacity by look <p>Estimate and compare length (cm and m), mass and capacity:</p> <ul style="list-style-type: none"> • compare quantities of length, area and capacity by looking then cover with tiles or superimpose to find which has the biggest area • compare quantities of mass by feeling 	<p>Estimate and measure to check length, mass, area and capacity using non-standard units:</p> <ul style="list-style-type: none"> • estimates can be described by using 'between', 'about', 'less', 'more', 'about the same' and 'almost' • estimates do not have to be exact but they need to be within reasonable limits • in many situations it is more practical to estimate than measure • an estimation is not wrong if it is not the same as the measurement. <p>Estimate and compare length, mass, capacity, area and time using standard units:</p> <ul style="list-style-type: none"> • common standard units (metric) <p>Use of personal benchmarks for length to help estimation:</p> <ul style="list-style-type: none"> • compare with known benchmarks which may include: <ul style="list-style-type: none"> -body measurements -the size of some common things • non-standard units that can be seen or handled • using a physical model to use in estimation • time familiar events take • clues to estimate the time of the day, week or year 	<p>Estimate and measure to check length, mass, area and capacity using non-standard units:</p> <ul style="list-style-type: none"> • estimates can be described by using 'between', 'about', 'less', 'more', 'about the same' and 'almost' • estimates do not have to be exact but they need to be within reasonable limits • in many situations it is more practical to estimate than measure • improve estimates by using results from previous estimates <p>Estimate, compare and measure to check length, mass, angle, capacity, area and time using common standard units:</p> <ul style="list-style-type: none"> • common standard units (metric) <p>Use of personal benchmarks and/or provided information and simple calculations to estimate length and time of common events:</p> <ul style="list-style-type: none"> • compare with known benchmarks which may include: <ul style="list-style-type: none"> • non-standard units that can be seen or handled • using a physical model to use in estimation • time familiar events take • clues to estimate the time of the day, week or year • ratios and fractions can be used for estimation

Chance & Data: *Students use their knowledge of chance and data handling processes in dealing with data and with situations in which uncertainty is involved.*

<ul style="list-style-type: none"> • Understand Chance 			
<ul style="list-style-type: none"> • Grade 2 • Language to describe events: • language to describe chance events (more likely, less likely, probably, could happen, could not happen, possible, impossible) • Elements of chance in familiar events: • familiar activities have an element of chance • repetitions of chance actions are likely to produce different results and are difficult to predict • listing possible outcomes assists with predicting likely and unlikely outcomes • predictions are informed guesses, based on previous experience and knowledge • Chance events can be ordered and compared: • everyday events can be described as more or less likely to happen 	<ul style="list-style-type: none"> • Grade 3 • Some specific language of chance: • identification of common events as: <ul style="list-style-type: none"> • -certain • -unlikely • -impossible • Elements of chance in familiar events: • some familiar events are certain • repetitions of chance actions are likely to produce different results and are difficult to predict • list the possible outcomes for a simple event • predictions are informed guesses, based on previous experience and knowledge • Elements of chance in familiar events: • some familiar events are certain • repetitions of chance actions are likely to produce different results and are difficult to predict • list the possible outcomes for a simple event • predictions are informed guesses, based on previous experience and knowledge • Chance events can be ordered and compared: • familiar everyday events can be described as more or less likely to happen • chance events can be sequenced from least to most likely to happen 	<ul style="list-style-type: none"> • Grade 4 • Specific language of chance: • chance has a specific language • familiar events can be identified as being possible and impossible • certain events include those that must happen and those that cannot happen, and uncertain events are those that may or may not happen. • Predict outcomes of familiar events: • predictions about familiar events can be based on prior outcomes • systematically list all of the relevant and possible outcomes for 'one-stage' events • listing all the outcomes of an event helps to predict likely and unlikely results of an event or experiment • Comparison and ordering of events by likelihood: • to compare and order chance events by the likelihood of them occurring • Design simple chance equipment: • to make and use simple probability devices • Informally represent probability: • place outcomes or events in order, based on numerical or measurement information provided, or on frequency data collected from experiments. 	<ul style="list-style-type: none"> • Grade 5 • Use the language of chance to make predictions: • to use the language of chance to make and explain predictions and order events in terms of their likelihood* • familiar events can be described as having equal chances of happening • to identify situations involving equally likely outcomes and distinguish them from situations where outcomes are not equally likely • Predict outcomes of events using data: • questions relating to chance events can be answered by collecting data • two entirely different events could have the same chance of happening • listing all the outcomes of an event helps to predict likely and unlikely results of an event or experiment • Comparison and ordering of events referring to known information: • to order events from least likely to most likely and justify the choices by referring to previous or known information • Design simple chance equipment: • to make and use simple probability devices • Informally represent probability: • the probability of an event can be stated on a scale from zero to one, where zero represents that the event is certain not to happen, one represents the event is certain to happen, and all uncertain events lie between these values
<ul style="list-style-type: none"> • Collect and organize data 			
<ul style="list-style-type: none"> • Ask questions to assist planning: • decide what information needs to be obtained to assist in the planning of questions and collecting and organising the 	<ul style="list-style-type: none"> • Ask questions to assist planning: • pose their own questions and raise issues of interest, and know that some questions are best answered and some issues are explored by 	<ul style="list-style-type: none"> • Ask questions to assist data collection: • pose and ask questions that can be answered by collecting data • Plan, collect and organise data: • there are different ways to collect or produce data 	<ul style="list-style-type: none"> • Clarify and refine questions: • pose and ask questions that can be answered by collecting data • Plan, collect, organise and record data: • compare different data collection methods (simple surveys, observations, experiments)

<ul style="list-style-type: none"> information asking questions is an important step in deciding what data to collect changing the criterion or questions can mean the same objects can be sorted in another way to provide new information Plan and collect data: data can be collected by counting, observing or measuring things record information in a consistent manner to ensure the data is accurate Organise data: classify items into categories using common attributes and name each group appropriately data can be represented in different ways 	<ul style="list-style-type: none"> collecting appropriate data* asking questions is an important step in deciding what data to collect ways of collecting and organising data using a suitable format for the context under consideration* Plan and collect data: use of technology to access data, record and present data record information in a consistent manner to ensure; the data is accurate Organise data: classify items into categories using common attributes and name each group appropriately classify objects using more than one criterion organise data using a suitable format for the context under consideration 	<ul style="list-style-type: none"> information collected must answer the questions posed plan an approach to data collection that minimises error and variation methods to collect data to answer different questions data collecting strategies to consider Group and categorise data: methods to organise data so it is helpful for answering a particular question 	<ul style="list-style-type: none"> and simulations) and select one suited to a given context when collecting data, a sample of the whole population can be used plan an approach to data collection that minimises error and variation when collecting frequency data, information may be lost and be difficult to retrieve decide whether collection and recording procedures need to be changed and whether new data should be collected as a consequence. Classify, sequence and tabulate data: classify, sequence and tabulate data
<ul style="list-style-type: none"> Summarise and represent data 			
<ul style="list-style-type: none"> Summarise data with whole numbers: summarise data numerically compare the size of classified groups using one-to-one correspondence. Display data in a variety of formats: represent data in ways that make it easy to read and compare information the method chosen to represent data should be based on the purpose for displaying and sharing conventions for recording and representing data hoops and two-way tables can be used when collections are sorted by more than one criterion use a baseline for easier comparison of data 	<ul style="list-style-type: none"> Summarise data with whole numbers: summarise data in words and numbers compare data using words like 'more than', 'less than', 'most', 'less', 'fewer', 'least', 'the same as'. Display data with an increased range of formats: represent discrete (finite amount) and continuous (infinite amount) data using a variety of diagrams and graphs use a suitable format for the context under consideration* conventions for recording and representing data hoops and two-way tables can be used when collections are sorted by more than one criterion use a baseline for easier comparison of data use of technology to assist in recording and presenting data 	<ul style="list-style-type: none"> Use whole numbers to summarise data: record data in a table using the conventions of tallying Use bar graphs, pictographs, organised lists, one-way tables and Venn diagrams to display data: conventions exist for creating and labelling graphs use one-way tables to format information in adjacent lists construct bar graphs and pictographs to represent frequencies or measurements of categories or groups use Venn diagrams to display two overlapping categories 	<ul style="list-style-type: none"> Use whole numbers to summarise and report data data can be summarised numerically and graphically Use bar graphs, pictographs, Venn diagrams and simple two-way tables to display data : conventions exist for creating and labelling graphs use two-way tables to represent a two-way classification use a range of graphs, including bar graphs, pie graphs and pictographs with suitable scales to represent the same data set and compare their effectiveness* use Venn diagrams to display two overlapping categories

• Interpret data			
<ul style="list-style-type: none"> • Read and interpret straightforward data displays: • ask focus questions to assist with description and interpretation of data • read, interpret and describe information from data displays, such as block graphs, lists and pictographs 	<ul style="list-style-type: none"> • Interpret, predict and draw conclusions from a range of data displays: • how to make qualitative judgements about data obtained from observations or experiments, and explain whether it supports or disagrees with a particular view using the appropriate language of chance* • identify and describe variations between and within sets of data, especially as seen in graphs • recognise simple relationships and make appropriate concluding comments • data may look different when represented in various ways, but it carries the same information 	<ul style="list-style-type: none"> • Interpret and describe straightforward data displays: • devise most/least amount of questions about data, after it is gathered • describe what a data collection demonstrates • determine frequencies from a pictograph or a bar graph in which each unit is marked on the axis • Analyse and review own data: • the same data can be represented in different forms, but the findings will be the same • review the purpose and usefulness of a data collection • advantages and disadvantages of the various types of graphs and tables relevant to the data collected • make simple statements about what is possible and what is not 	<ul style="list-style-type: none"> • Interpret and make predictions using data displays: • analyse data and make statements and predictions that respond to questions or issues • identify and describe variation within sets of data • determine frequencies from a pictograph or a bar graph, in which each unit is marked on the axis • Analyse and review data and data predictions: • comment on predictions, in light of the collected data • review the purpose and usefulness of a data collection • advantages and disadvantages of the various types of graphs and tables relevant to the data collected • make statements about what is possible and what is not

Space: *Students describe and analyse mathematically the spatial features of objects, environments and movements.*

1. Represent Location			
Grade 2	Grade 3	Grade 4	Grade 5
<p>Language of position, orientation and direction:</p> <ul style="list-style-type: none"> • the language of position, orientation and direction • use the language of position, direction and orientation to: <ul style="list-style-type: none"> -follow directions -act out -find an object -follow a path <p>Interpretation of simple maps and plans:</p> <ul style="list-style-type: none"> • maps arrange and order the objects in a certain environment, and use symbols and labels to represent real things • interpret simple maps and plans and identify the most obvious features • there are different ways to draw plans and maps, including from a top view • paths exist within an environment, in mazes and on maps 	<p>Language of position, orientation and direction:</p> <ul style="list-style-type: none"> • use and interpret the language of turns • use the language of position, direction and orientation to: <ul style="list-style-type: none"> -act out movement -find an object -follow a path -move from one place to another on a map or grid. <p>Interpretation of simple maps and plans:</p> <ul style="list-style-type: none"> • maps arrange and order the objects in a certain environment, and use symbols and labels to represent real things • identify the key features of simple maps, grids and plans, follow directions for moving around and find specific locations • make sketches of and interpret maps of generally familiar environments, and give directions for moving from one point to another • paths exist within an environment, on maps and mazes 	<p>Language for order and proximity:</p> <ul style="list-style-type: none"> • directional language associated with maps • compass points represent location • give and follow sequenced directions <p>Simple maps and plans:</p> <ul style="list-style-type: none"> • use the horizontal reference point then the vertical one to locate objects on a grid • interpret simple maps and plans, drawn from a bird's-eye view • draw familiar locations from a bird's-eye view • scale is used to enlarge or reduce maps or plans 	<p>Language for position and direction:</p> <ul style="list-style-type: none"> • directional language • compass points represent location • give and follow sequenced directions using distance and direction <p>Maps and plans using simple scales:</p> <ul style="list-style-type: none"> • use maps to find and describe locations and paths using distance, direction and grid coordinates • interpret and use symbols and conventions* on maps to locate key features • draw bird's-eye view (aerial) maps or plans of familiar places which: <ul style="list-style-type: none"> -use a sense of scale -represent key features -others find easy to read • use a simple scale to estimate lengths and distances on maps, grids and plans
1. Represent Shape			

<p>Language of shapes and their attributes:</p> <ul style="list-style-type: none"> • use language to describe shapes and attributes of shapes • shapes and objects can be sorted according to familiar attributes, similarities and differences can be discussed <p>Identification of 2D shapes in 3D objects:</p> <ul style="list-style-type: none"> • identify 2D shapes within a 3D object • attend to shape and structure when making things <p>Drawings and representations of shapes:</p> <ul style="list-style-type: none"> • draw 2D shapes showing the essential spatial features • recognise angle in shapes, objects and in turns • drawings of things can be shown from different views • parts of shapes or objects that exist are not always visible in drawings or photographs • draw a shape or make a model of an object from an oral description that involves spatial language 	<p>Language to compare shapes and their attributes:</p> <ul style="list-style-type: none"> • use language to describe the attributes and to distinguish families of shapes and objects • identify and describe families of common 2D and 3D shapes and objects including squares, rectangles, triangles, circles, prisms, pyramids, cones, cylinders and spheres <p>Identification of 2D shapes in 3D objects:</p> <ul style="list-style-type: none"> • identify and describe the differences between 2D shapes and 3D objects and also how they are linked • attend to shape and structure when making things <p>Drawings and representations of shapes:</p> <ul style="list-style-type: none"> • draw 2D shapes showing the essential spatial features • recognise angle in shapes, objects and in turns • drawings of things can be shown from different views • make models of 3D objects and draw (freehand, with a template or using a computer draw tool) shapes and objects illustrating their key features • draw, make or identify an object from an oral description that involves spatial language 	<p>Features of 2D shapes and 3D objects:</p> <ul style="list-style-type: none"> • use appropriate spatial language to describe features of shapes and objects • match simple geometric models with realistic drawings • use given features to identify or predict 2D shapes and 3D objects • 3D shapes can be made in solid forms, hollow forms and skeletal forms using plasticine, cardboard nets and straws • a net is arranged in a particular way, so that when folded, all the parts come together to make a 3D shape • match nets to clearly different 3D objects <p>Drawings of simple 2D shapes and 3D objects:</p> <ul style="list-style-type: none"> • 2D shapes have two dimensions that can be drawn, modelled or visualised (length and width) • draw 2D shapes showing the essential spatial features • draw and describe 2D shapes in different orientations • 3D objects have three dimensions (length, width and depth) that can be drawn, modelled or visualised • geometric models can be matched to everyday items and diagrams • position determines different views of an object 	<p>Features and models of 2D shapes and 3D objects:</p> <ul style="list-style-type: none"> • use appropriate spatial language to describe features of shapes and objects • match geometric models with realistic drawings • use given features to identify or predict 2D shapes and 3D objects • 3D shapes can be made in solid forms, hollow forms and skeletal forms using plasticine, cardboard nets and straws • there may be more than one net that folds up to make the same 3D object • match nets to drawings and 3D objects such as different prisms and pyramids <p>Drawings of 2D shapes and 3D objects:</p> <ul style="list-style-type: none"> • 2D shapes form the faces of prisms and pyramids • draw 2D shapes and 3D objects showing the essential spatial features • draw and describe 2D shapes in different orientations (Mathematics) • the conventions of drawing 3D objects to make things 'look right' • represent and describe 3D shapes and objects, using technology as appropriate, from different perspectives, highlighting relevant features • geometric models can be matched to everyday items and diagrams • position determines different views of an object
2. Represent transformations			

<p>Pictures and patterns with shapes:</p> <ul style="list-style-type: none"> • language to describe movement • two figures are the same if one fits on the other exactly • transform hand-drawn or cut-out shapes to make pictures and patterns <p>Creation of simple shape patterns:</p> <ul style="list-style-type: none"> • construct repetitive patterns, with multiple copies of shapes, using simple movements such as flipping, sliding and turning • how to follow and describe simple movement rules for generating repetitive patterns • the effect of spatial changes can be predicted without having to actually carry out the change • shapes that tessellate go together without gaps or overlaps to cover an area and can be made by repeatedly flipping, sliding or turning a shape. <p>Simple symmetrical patterns:</p> <ul style="list-style-type: none"> • use language of symmetry • identify symmetry in a variety of 2D shapes and designs • make symmetrical patterns, pictures and pictures combined with symmetrical patterns • symmetrical pictures and patterns are reflected along the line of symmetry 	<p>Flipping, sliding and turning shapes:</p> <ul style="list-style-type: none"> • language of transformations • changing position of a shape does not change the shape itself • transform hand-drawn, cut-out or computer generated shapes to make pictures and patterns <p>Creation of simple shape patterns:</p> <ul style="list-style-type: none"> • construct repetitive patterns, with multiple copies of shapes, using simple movements such as flipping, sliding and turning • explore and describe the effect of a single flip, slide or turn on a range of shapes • create repeating patterns with 3D objects • use symmetry and/or transformations to create or continue patterns including tessellations <p>Reflectional symmetry:</p> <ul style="list-style-type: none"> • language to describe symmetrical patterns and shapes evident in the environment use mirrors, folding and other techniques to explore and identify line symmetry in a variety of shapes • use hand-drawn, cut-out or computer-generated shapes to make symmetrical patterns and pictures 	<p>Simple translations, rotations and reflections of shape:</p> <ul style="list-style-type: none"> • the language of transformations • predict the effect of a flip on a shape or object • find transformations embedded in designs <p>Creation of simple tiling patterns:</p> <ul style="list-style-type: none"> • describe the result of combinations of transformations of a shape and create patterns and designs • some shapes will fit together to create a tiling pattern while others will not <p>Reflectional symmetry:</p> <ul style="list-style-type: none"> • language to describe symmetrical patterns and shapes • identify reflectional (line or mirror) symmetry and the lines of symmetry • produce symmetrical patterns and pictures using a variety of means 	<p>Translations, rotations and reflections of shape:</p> <ul style="list-style-type: none"> • the language of transformations • predict the effect of a flip (reflection) or slide (translation) on a shape or object • find repetition within patterns <p>Creation of tessellations:</p> <ul style="list-style-type: none"> • describe the result of combinations of transformations of a shape and create patterns and designs • some shapes will fit together (tessellate), to create a tiling pattern while others will not <p>Reflectional symmetry:</p> <ul style="list-style-type: none"> • language to describe symmetrical patterns and shape • identify reflectional (line or mirror) symmetry and the lines of symmetry • produce symmetrical patterns and pictures using a variety of means • identify symmetrical shapes and designs <p>Simple enlargements and reductions:</p> <ul style="list-style-type: none"> • enlarging and reducing changes size but not shape • reduce or enlarge simple 3D models
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3. Reason geometrically			
<p>Language of shape, movement and function:</p> <ul style="list-style-type: none"> • use the names of common 2D shapes and 3D objects to describe, identify and compare attributes and functions. <p>Classification using spatial properties:</p> <ul style="list-style-type: none"> • properties of common regular and irregular 2D shapes • the properties of a 2D shape are used to group and name • figures and objects can be sorted/classified based on shape (how things look), transformations (how things move or change) and locations (where they are) • properties of shapes can be similar but not identical <p>Shape, movement and function of familiar objects:</p> <ul style="list-style-type: none"> • familiar objects can be classified using simple criteria related to shape, movement or function 	<p>Language of shape, movement and function:</p> <ul style="list-style-type: none"> • use the names of 2D shapes and 3D objects <p>Classification using spatial properties:</p> <ul style="list-style-type: none"> • properties of common regular and irregular 2D shapes • the properties of a 2D shape are used to group and name • shapes and objects can be sorted/classified based on shape (how things look), transformations (how things move or change) and locations (where they are) • properties of shapes can be similar but not identical <p>Relationships between shape, movement and function:</p> <ul style="list-style-type: none"> • shapes can be sorted/classified by more than one criterion 	<p>Language to sort, classify and describe figures and objects:</p> <ul style="list-style-type: none"> • geometric names of 2D figures and 3D objects • spatial language used to differentiate between 2D figures and 3D objects • spatial language to sort, classify, select, describe and reason about 2D figures and 3D objects <p>Classification using spatial criteria:</p> <ul style="list-style-type: none"> • figures and objects can be sorted/classified according to simple criteria • identify common 2D shapes by the number of sides • generalise about the features of families of shapes • properties and features of 3D objects with attention to sides (faces), corners (vertices) and edges • describe cross-sections (the 2D face visible when a 3D object is cut through) of familiar objects <p>Function of shape in the environment:</p> <ul style="list-style-type: none"> • investigate to find which shapes are most commonly found in a given situation 	<p>Spatial language to describe movement and the attributes of shape:</p> <ul style="list-style-type: none"> • specific geometric names of 2D figures and 3D objects • spatial language to describe the attributes of 2D figures and 3D objects • select an object from a collection, given a description of its spatial features <p>Classification using spatial properties and features:</p> <ul style="list-style-type: none"> • figures and objects can be sorted/classified according to properties and features • identify regular (all sides equal and all angles equal) and irregular 2D figures • identify unique features of some shapes within a shape family • properties and features of 3D objects with attention to faces, vertices and edges • recognise and describe cross-sections of familiar 3D shapes through practical experiences <p>Links between shape and function:</p> <ul style="list-style-type: none"> • spatial features of objects can be linked to functions such as stability, strength and storage