

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
--	------	------	------	---------	---------	---------	---------	---------

# NUMBER

Our number system is a language for describing quantities and the relationships between quantities. For example, the value attributed to a digit depends on its place within a base system. Numbers are used to interpreting information, make decisions and solve problems. For example, the operations of addition, subtraction, multiplication and division are related to one another and are used to process information to solve problems. The degree of precision needed in calculating depends on how the result will be used.

## Overall Expectation

Phase 1	Phase 2	Phase 3	Phase 4
Learners will understand that numbers are used for many different purposes in the real world. They will develop an understanding of one-to-one correspondence and conservation of numbers, and be able to count and use number words and numerals to represent quantities.	Learners will develop their understanding of the base 10 place value systems and will model, read, write, estimate, compare and order numbers to hundreds or beyond. They will have automatic recall of addition and subtraction facts and be able to model addition and subtraction of whole numbers using the appropriate mathematical language to describe their mental and written strategies. Learners will have an understanding of fractions as representations of whole-part relationships and will be able to model fractions and use fraction names in real-life situations.	Learners will develop the understanding that fractions and decimals are ways of representing whole-part relationships and will demonstrate this understanding by modelling equivalent fractions and decimal fractions to hundredths or beyond. They will be able to model, read, write, compare and order fractions, and use them in real-life situations. Learners will have automatic recall of addition, subtraction, multiplication and division facts. They will select, use and describe a range of strategies to solve problems involving addition, subtraction, multiplication and division, using estimation strategies to check the reasonableness of their answers.	Learners will understand that the base 10 place value system extends infinitely in two directions and will be able to model, compare, read, write and order numbers to millions or beyond, as well as model integers. They will develop an understanding of ratios. They will understand that fractions, decimals and percentages are ways of representing whole-part relationships and will work towards modelling, comparing, reading, writing, ordering and converting fractions, decimals and percentages. They will use mental and written strategies to solve problems involving whole numbers, fractions and decimals in real-life situations, using a range of strategies to evaluate the reasonableness of answers.

## Conceptual understandings and Grade level indicators

<p>Numbers are a naming system.</p> <p>Numbers can be used in many ways for different purposes in the real world.</p> <p>Numbers are connected to each other through a variety of relationships.</p> <p>Making connections between our experiences with numbers can help us to develop number sense.</p>	<p>The base 10 place value system is used to represent numbers and number relationships.</p> <p>Fractions are ways of representing whole-part relationships.</p> <p>The operations of addition, subtraction, multiplication and division are related to each other and are used to process information to solve problems.</p> <p>Number operations can be modelled in a variety of ways.</p> <p>Many mental methods can be applied for exact and approximate computations.</p>	<p>The base 10 place value systems can be extended to represent magnitude.</p> <p>Fractions and decimals are ways of representing whole-part relationships.</p> <p>The operations of addition, subtraction, multiplication and division are related to each other and are used to process information to solve problems.</p> <p>Even complex operations can be modelled in a variety of ways, for example, an algorithm is a way to represent an operation.</p>	<p>The base 10 place value system extends infinitely in two directions.</p> <p>Fractions, decimals and percentages are ways of representing whole-part relationships.</p> <p>For fractional and decimal computation, the ideas developed for whole-number computation can apply.</p> <p>Ratios are a comparison of two numbers or quantities.</p>
--	--	---	---



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
<b>Read, writing and represent numbers</b>	<p>Read numbers in order from zero to 10.</p> <p>Understand one-to-one correspondence</p> <p>Selects the correct numeral to represent numbers 1 to 5.</p>	<p>Read numbers in figures from 0 to 20.</p>	<p>Read and write, using the correct formation, numbers in figures from 0 to 50.</p>	<p>Read and write, using the correct formation, whole numbers to at least 100 and know what each digit represents.</p>	<p>Read and write whole numbers to at least 1000 and beyond and know what each digit represents.</p>	<p>Read and write whole numbers up to 10,000 and know what each digit represents.</p> <p>Use decimal notation for tenths and know what each digit represents.</p>	<p>Whole numbers up to 100,000 and know what each digit represents.</p> <p>Use decimal notation for tenths and hundredths and know what each digit represents.</p>	<p>Whole numbers up to 1,000,000+ and know what each digit represents.</p> <p>Use decimal notation for tenths, hundredths and thousandths; know what each digit in a decimal fraction represents.</p>
<b>Counting, compare and order</b>	<p>Count on and back from any given number to 10.</p> <p>Compare and order numbers to 10.</p> <p>Counts out up to 10 objects from a larger group.</p> <p>Beginning to represent numbers using fingers, marks on paper or pictures.</p>	<p>Count on and back from any given number to 20.</p> <p>Compare and order numbers to 20.</p> <p>Develop strategies for accurately counting a set of objects by ones.</p> <p>Recognise ordinal numbers up to 10th to describe the position.</p> <p>Use the language to compare more/less/first.</p>	<p>Count on and back from any given number to 50. Compare and order numbers to 50.</p> <p>Count forwards by 2s, 5s and 10s.</p> <p>Recognise ordinal numbers up to 20th to describe the position.</p>	<p>Count on and back from any given number to at least 100.</p> <p>Count forwards by 2s, 5s and 10s from 0.</p> <p>Compare and order numbers to 100.</p> <p>Develop strategies for + and – facts (number bonds)</p>	<p>Count on and back from any given number to at least 1000.</p> <p>Count forwards by 2s, 3s, 5s and 10s from any starting point.</p> <p>Compare and order numbers to 1000</p> <p>Develop strategies for + and – facts (number bonds)</p>	<p>Count on and back from any given number to at least 10,000.</p> <p>Count for- and backwards by 10 and 100 from any starting point e.g. 247, 347, 447.</p> <p>Compare, order and estimate quantities up to 10,000</p>	<p>Count on and back from any given number to 100,000.</p> <p>Count for- and backwards by 10, 100 and 1000 from any starting point e.g. 548, 1,548, 2,548.</p> <p>Compare order and estimate quantities up to 100,000 and decimals numbers to 1 decimal place.</p> <p>Count on and back in tenths from a given decimal number.</p>	<p>Count on and back in tenths and hundredths from any given number.</p> <p>Count forwards and backwards involving negative numbers.</p> <p>Compare and order numbers up to at least 1,000,000 and decimals to two decimal places (e.g. 1.2 is greater than 1.15)</p>



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
<b>Rounding</b>					Can round any positive integer up to 100 to the nearest 10.	Round any positive integer up to 1000 to the nearest 10 or 100.	Round any positive integer up to 10,000 to the nearest 10, 100 and 1000.  Round a decimal with 1 and 2 decimal places to 1 decimal place and to the nearest integer.	Round any positive integer to the nearest 10, 100, 1000, 10,000 and 100,000.  Round a decimal number to 3 decimal places and the nearest integer.
<b>Estimating</b>	Recognise groups of up to 5 objects without counting.	Guess the number of objects up to 10.	Begin to estimate quantities to 20.  Use estimations in real-life situations (estimate if there are enough items e.g. enough chairs for class).	Begin to estimate quantities to 100 (estimation jar).  Start to estimate sums and differences.	Begin to write the vocabulary of estimation and approximation.  Estimate sums and differences.	Estimate approximate answers of written calculations as a strategy to avoid errors (+, -, x & ÷).	Estimate approximate answers of written calculations as a strategy to avoid errors (+, -, x & ÷).	Use estimation and rounding to check the reasonableness of answers to calculations (+, -, x & ÷).
<b>Money</b>				Recognise and know the value of different denominations of coins and notes.  Recognise, describe and order Toman and Euro notes according to their value.	Count and order small collections of Toman/Euro coins and/or notes according to their value.  Solve real-life problems involving money, knowing that €1 = 100 cents.	Solve real-life problems involving money.  Also introduce other international money and units, i.e. dollars, pounds, euros.	Use all 4 operations to solve real-life problems involving purchases and the calculation of change.  Also, when using international currencies.	Use all 4 operations to solve real-life problems involving purchases and the calculation of change, using international currencies and starting to convert between currencies.
				Solve problems involving money i.e. €5 + €4 = €9 or similar for Toman				

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
<b>Adding and subtraction</b>	<p>Understands that numbers can be constructed in multiple ways for example by combining and partitioning.</p> <p>Use mathematical language to compare quantities (less, more, first, second...)</p> <p>In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.</p> <p>Find the total number of items in two groups by counting all of them.</p>	<p>Begin to use the language of adding and take-away using practical ways and manipulatives and real-life situations.</p> <p>Use manipulatives to add two groups together to 10 and represent as a number story using the vocabulary of adding/ plus/ altogether.</p>	<p>Represent practical situations to model addition and subtracting.</p> <p>Use the language of getting bigger or smaller linked to real-life examples. Recognise, write and recall number bonds to 10.</p>	<p>Use manipulatives to add and subtract represent as a number story e.g. +, -, =.</p> <p>Use manipulatives and mental strategies to add and subtract to 20/50/100</p> <p>Represent addition and subtraction number sentences using +, - and =.</p> <p>Interpret addition and subtraction word problems.</p> <p>Use the language of adding and take-away vocabulary.</p>	<p>Solve real-life 3-digit addition and subtraction problems accurately and efficiently, using written methods to record, support or explain their answer.</p> <p>Understand and use the relationship between addition and subtraction and multiplication and division (with manipulatives).</p>	<p>Refine and use efficient written methods to add and subtract 4-digit whole numbers (and decimals in the context of money).</p> <p>Use inverse operations to check answers.</p>	<p>Use efficient written methods to solve real-life word problems by adding and subtracting integers up to 5-digits and decimals up to 2 decimal places (adding placeholders where necessary).</p>	<p>Use efficient written methods to solve real-life word problems by adding and subtracting integers up to 6-digits and decimals up to 3 decimal places (adding placeholders where necessary).</p> <p>Select an appropriate sequence of operations to solve a multistep word problem.</p>
<b>Multiplying and</b>	<p>Compares or model two groups of objects, saying when they have the</p>	<p>Beginning to be aware of arrays by modelling equal groups or rows.</p>	<p>Solve one-step problems involving multiplication and division, by calculating the answer using</p>	<p>Recognise and represent multiplication as repeated addition, skip counting, equal</p>	<p>Recognise and represent multiplication as repeated addition, skip counting, equal groups and arrays.</p>	<p>Multiply and divide 2-digit and 3-digit numbers by a 1-digit number choosing from a</p>	<p>Multiply numbers up to 4 digits by a 1-or 2-digit number using efficient mental, written strategies and</p>	<p>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using efficient mental, written strategies and</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
<b>dividing</b>	same number.	Share a collection of objects equally being aware of unequal.	concrete objects, pictorial representations and arrays with the support of the teacher.	groups and arrays.  Identify number patterns (using a 100 square).	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods	variety of strategies.  Know that multiplication and division are related.  Consolidate multiplication facts for all times tables and know related divisions.	appropriate digital technologies.  Multiply and divide numbers mentally, drawing upon known facts.	appropriate digital technologies.  Know that multiplication facts are related e.g. $5 \times 7 = 35$ , $5 \times 70 = 350$ , $5 \times 700 = 3500$ , $35 / 5 = 7$ .
		Solve number problems including doubling, halving and sharing.		Recall and use multiplication facts for the 1, 2, 5 and 10, and link to the related divisions.  Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the relevant signs.	Solve problems, including missing number problems, involving multiplication and division.  Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot.	Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems. Also using the distributive law to multiply 2 and 3-digit numbers by a 1-digit number.	Divide numbers up to 4 digits by a 1-digit number using the formal written method and interpret remainders appropriately for the context.  Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000.	Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
<b>Fractions, Decimals and Percentages</b>	Use simple fraction names in real-life situations.	Use simple fraction names in real-life situations.	Begin to recognise and use the vocabulary of half of a whole, and whole object (e.g. half a fruit).	Recognise that a fraction divides the whole into equal parts.	Begin to understand the meaning of the digits in a fraction e.g. numerator is a count of the parts and the denominator tells how many parts.	Understand the meaning of the digits in a fraction e.g. numerator is a count of the parts and the denominator tells how many parts.	Compare and order fractions whose denominators are all multiples of the same number.	Understand, convert between, compare, model and order fractions, decimals and percentages including proper and improper fractions, mixed numbers and fractions $>1$ .
	Recognise an object and shape that has been halved.	Recognise and describe a shape or object that has been halved.	Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity.  Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity.	Recognise and interpret common uses of halves and quarters of shapes and collections.  Model and write simple fractions, for example $\frac{1}{2}$ of 6 = 3.	Recognise and interpret common uses of halves, quarters and eighths of shapes and collections.  Recognise, find, name and write fractions $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity.  Recognise and show, using diagrams, equivalent fractions.  Add and subtract fractions with the same denominator within one whole (i.e. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ).  Compare and order unit fractions, and fractions with the	Consolidate unit fractions such as $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{1}{5}$ and use them to find fractions of objects and recognise unit fractions that are several parts of a whole.  Identify that fractions are iterations (repeats) of a unit fraction, i.e. $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ .  Read, write and recognise and show, using diagrams, families of common equivalent fractions.  Count up and down in hundredths.	Identify, name and write equivalent fractions of a given fraction.  Compare fractions, decimals and percentages to the benchmarks of 0, $\frac{1}{2}=0.5=50\%$ , $1=1.00=100\%$ , also using a pie chart.  Locate fractions, decimals and percentages on a number line.  Represent fractions, decimals and percentages using concrete materials, words, and standard fractional notation.  Read, write, order, model and compare fractions and numbers with up to 2 decimal places (money).	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.  Real life: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.  Multiply and divide numbers and decimals by 10, 100 and 1,000 giving answers up to 3 decimal places.  Multiply one-digit numbers with up to 2 decimal places by whole numbers.  Use written division methods in cases where the answer has up to 2 decimal places, i.e. $1511 \div 4$



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
					<p>same denominators.</p> <p>Use simple fractions in real-life situations.</p> <p>Understand that <math>\frac{1}{2} = 50\% = 0.5</math></p>	<p>Add and subtract fractions with the same denominator.</p> <p>Solve a range of problems including Non-unit fractions where an answer is a whole number.</p> <p>Recognise and write decimal equivalents of any number of tenths or hundreds</p> <p>Recognise and write decimal equivalents to <math>\frac{1}{4}, \frac{1}{2}, \frac{3}{4}</math>.</p> <p>Compare decimals up to 1 decimal place.</p>	<p>Model equivalent fractions.</p> <p>Add and subtract fractions with the same denominator, and denominators that are multiples of the same number.</p> <p>Solve problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}</math> and those fractions with a denominator of a multiple of 10 or 25</p>	<p>Recognise mixed numbers and improper fractions and convert from one form to the other.</p> <p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p> <p>Solve percentage of amount problems with and without a calculator.</p> <p>Add and subtract decimal numbers to hundredths, including money amounts.</p> <p>Model ratios</p> <p>Read and write ratios</p> <p>Use ratios in real-life situations.</p>
Mental Maths				<p>Add or subtract a pair of single-digit numbers, including crossing 10, e.g. <math>5 + 8, 12 - 7</math></p> <p>Add any single-digit number to or from a multiple of 10, e.g. <math>60 + 5</math></p>	<p>Add and subtract groups of small numbers, e.g. <math>5 - 3 + 2</math></p> <p>Add or subtract a 2-digit number to or from a multiple of 10, e.g. <math>50 + 38, 90 - 27</math></p>	<p>Add or subtract any pair of 2-digit numbers, including crossing the tens and 100 boundaries, e.g. <math>47 + 58, 91 - 35</math></p> <p>Add or subtract a near multiple of 10, e.g. <math>56 + 29, 86 - 38</math></p>	<p>Add or subtract a pair of 2-digit numbers or 3-digit multiples of 10, e.g. <math>38 + 86, 620 - 380, 350 + 360</math></p> <p>Add or subtract a near multiple of 10 or 100 to any 2-digit or 3-digit</p>	<p>Add or subtract pairs of decimals with units, tenths or hundredths, e.g. <math>0.7 + 3.38</math></p> <p>Find doubles of decimals each with units and tenths, e.g. <math>1.6 + 1.6</math></p> <p>Add near doubles of decimals, e.g. <math>2.5 + 2.6</math></p>



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
				<p>Subtract any single-digit number from a multiple of 10, e.g. <math>80 - 7</math></p> <p>Add or subtract a single digit number to or from a two-digit number, including crossing the tens boundary, e.g. <math>23 + 5</math>, <math>57 - 3</math>, then <math>28 + 5</math>, <math>52 - 7</math></p> <p>Add or subtract a multiple of 10 to or from any 2-digit number, e.g. <math>27 + 60</math>, <math>72 - 50</math></p> <p>Add 9, 19, 29, ... or 11, 21, 31, ...</p> <p>Add near doubles, e.g. <math>13 + 14</math>, <math>39 + 40</math></p> <p>Double any multiple of 5 up to 50, e.g. double 35.</p> <p>Halve any multiple of 10 up</p>	<p>Add and subtract 2-digit numbers e.g. <math>34 + 65</math>, <math>68 - 35</math></p> <p>Add near doubles, e.g. <math>18 + 16</math>, <math>60 + 70</math></p> <p>Double any multiple of 5 up to 100, e.g. double 35</p> <p>Halve any multiple of 10 up to 200, e.g. halve 170</p> <p>Multiply 1-digit or 2-digit numbers by 10 or 100, e.g. <math>7 \times 100</math>, <math>46 \times 10</math>, <math>54 \times 100</math></p> <p>Find unit fractions of numbers and quantities involving halves, thirds, quarters, fifths and tenths</p>	<p>Add near doubles of 2-digit numbers, e.g. <math>38 + 37</math></p> <p>Add or subtract 2-digit or 3-digit multiples of 10, e.g. <math>120 - 40</math>, <math>140 + 150</math>, <math>370 - 180</math></p> <p>Double any 2-digit number, e.g. double 39</p> <p>Double any multiple of 10 or 100, e.g. double 340, double 800, and halve the corresponding multiples of 10 and 100</p> <p>Halve any even number to 200</p> <p>Find unit fractions and simple non-unit fractions of numbers and quantities, e.g. <math>3/8</math> of 24</p> <p>Multiply and divide numbers to 1000 by 10 and then 100 (whole number answers), e.g. <math>325 \times 10</math>, <math>42 \times 100</math>, <math>120 \div 10</math>, <math>600 \div 100</math>, <math>850 \div 10</math></p>	<p>number, e.g. <math>235 + 198</math></p> <p>Find the difference between near multiples of 100, e.g. <math>607 - 588</math>, or of 1000, e.g. <math>6070 - 4087</math></p> <p>Add or subtract any pairs of decimal fractions each with units and tenths, e.g. <math>5.7 + 2.5</math>, <math>6.3 - 4.8</math></p> <p>Multiply and divide 2-digit numbers by 4 or 8, e.g. <math>26 \times 4</math>, <math>96 \div 8</math></p> <p>Multiply 2-digit numbers by 5 or 20, e.g. <math>320 \times 5</math>, <math>14 \times 20</math></p> <p>Multiply by 25 or 50, e.g. <math>48 \times 25</math>, <math>32 \times 50</math></p> <p>Double three-digit multiples of 10 to 500, e.g. <math>380 \times 2</math>, and find the corresponding halves, e.g. <math>760 \div 2</math></p> <p>Find the remainder after dividing a 2-</p>	<p>Add or subtract a decimal with units and tenths, that is nearly a whole number, e.g. <math>4.3 + 2.9</math>, <math>6.5 - 3.8</math></p> <p>Multiply pairs of 2-digit and single-digit numbers, e.g. <math>28 \times 3</math></p> <p>Divide a 2-digit number by a single-digit number, e.g. <math>68 \div 4</math></p> <p>Divide by 25 or 50, e.g. <math>480 \div 25</math>, <math>3200 \div 50</math></p> <p>Double decimals with units and tenths, e.g. double 7.6, and find the corresponding halves, e.g. half of 15.2</p> <p>Multiply pairs of multiples of 10 and 100, e.g. <math>50 \times 30</math>, <math>600 \times 20</math></p> <p>Divide multiples of 100 by a multiple of 10 or 100 (whole number answers), e.g. <math>600 \div 20</math>, <math>800 \div 400</math>, <math>2100 \div 300</math></p> <p>Multiply and divide 2-digit decimals such as <math>0.8 \times 7</math>, <math>4.8 \div 6</math></p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
				<p>to 100, e.g. halve 90.</p> <p>Find half of the even numbers to 40.</p> <p>Find the total number of objects when they are organised into groups of 2, 5 or 10.</p>		<p>Multiply a multiple of 10 to 100 by a single-digit number, e.g. <math>40 \times 3</math></p> <p>Multiply numbers to 20 by a single-digit, e.g. <math>17 \times 3</math></p> <p>Identify the remainder when dividing by 2, 5 or 10</p> <p>Give the factor pair associated with a multiplication fact, e.g. identify that if <math>2 \times 3 = 6</math> then 6 has the factor pair 2 and 3</p>	<p>digit number by a single-digit number, e.g. <math>27 \div 4 = 6 \text{ R } 3</math></p> <p>Multiply and divide whole numbers and decimals by 10, 100 or 1000, e.g. <math>4.3 \times 10</math>, <math>0.75 \times 100</math>, <math>25 \div 10</math>, <math>673 \div 100</math>, <math>74 \div 100</math></p> <p>Multiply pairs of multiples of 10, e.g. <math>60 \times 30</math>, and a multiple of 100 by a single digit number, e.g. <math>900 \times 8</math></p> <p>Divide a multiple of 10 by a single-digit number (whole number answers) e.g. <math>80 \div 4</math>, <math>270 \div 3</math></p> <p>Find fractions of whole numbers or quantities, e.g. <math>\frac{2}{3}</math> of 27, <math>\frac{4}{5}</math> of 70kg</p> <p>Find 50%, 25% or 10% of whole numbers or quantities, e.g. 25% of 20 kg, 10% of £80</p> <p>Find factor pairs for</p>	<p>Find 10% or multiples of 10%, of whole numbers and quantities, e.g. 30% of 50 ml, 40% of £30, 70% of 200g</p> <p>Simplify fractions by cancelling down</p> <p>Scale up and down using known facts, e.g. given that three oranges cost 24p, find the cost of four oranges</p> <p>Identify numbers with odd and even numbers of factors and no factor pairs other than 1 and themselves</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
							numbers to 100, e.g. 30 have the factor pairs $1 \times 30$ , $2 \times 15$ , $3 \times 10$ and $5 \times 6$	

# PATTERN and FUNCTION

To identify a pattern is to begin to understand how mathematics applies to the world in which we live. The repetitive features of patterns can be identified and described as generalized rules called "functions". This builds a foundation for the later study of algebra.

## Overall Expectation

Phase 1	Phase 2	Phase 3	Phase 4
Learners will understand that patterns and sequences occur in everyday situations. They will be able to identify, describe, extend and create patterns in various ways.	Learners will understand that whole numbers exhibit patterns and relationships that can be observed and described, and that the patterns can be represented using numbers and other symbols. As a result, learners will understand the inverse relationship between addition and subtraction, and the associative and commutative properties of addition. They will be able to use their understanding of patterns to represent and make sense of real-life situations and, where appropriate, to solve problems involving addition and subtraction.	Learners will analyse patterns and identify rules for patterns, developing the understanding that functions describe the relationship or rules that uniquely associate members of one set with members of another set. They will understand the inverse relationship between multiplication and division, and the associative and commutative properties of multiplication. They will be able to use their understanding of patterns and functions to represent and make sense of real-life situations and, where appropriate, to solve problems involving the four operations.	Learners will understand that patterns can be represented, analysed and generalized using algebraic expressions, equations or functions. They will use words, tables, graphs and, where possible, symbolic rules to analyse and represent patterns. They will develop an understanding of exponential notation as a way to express repeated products, and of the inverse relationship that exists between exponents and roots. The students will continue to use their understanding of patterns and functions to represent and make sense of real-life situations and to solve problems involving the four operations.

## Conceptual understandings and Grade level indicators

Patterns and sequences occur in everyday situations.  Patterns repeat and grow.	Whole numbers exhibit patterns and relationships that can be observed and described.  Patterns can be represented using numbers and other symbols.	Functions are relationships or rules that uniquely associate members of one set with members of another set.  By analysing patterns and identifying rules for patterns it is possible to make predictions.	Patterns can often be generalized using algebraic expressions, equations or functions.  Exponential notation is a powerful way to express repeated
---	--	--	--

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
--	------	------	------	---------	---------	---------	---------	---------



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
	<p>Understand that patterns can be found in everyday situations, sounds, actions, objects and nature.</p> <p>Recognise and describe repeating patterns in the environment.</p> <p>Recognise and describe in various ways – using words, drawings, symbols, materials, actions and numbers.</p>	<p>Recognise, describe and create simple patterns, including shape, numbers, objects, actions and sound/clap patterns (two attributes).</p> <p>Recognise, extend and describe patterns in the environment.</p>	<p>Create, describe and extend patterns using real objects e.g. colours, shapes, numbers, sounds, objects, actions, nature, and words.</p> <p>Recognize, understand and describe and extend patterns in numbers: odd and even, skip counting 2's, 5's and 10's.</p> <p>Patterning using two or more attributes.</p> <p>Use the properties and relations of + and – to solve problems.</p>	<p>Create, describe and extend patterns using two or more attributes (symbols, actions, drawings and numbers).</p> <p>Recognize, understand and describe and extend patterns in numbers: odd and even, skip counting 2's, 5's and 10's.</p> <p>Understand that there is an inverse operation for adding and taking away and model it using manipulatives and numbers.</p> <p>Begin to investigate the conditions required for a number to be odd or even, and identify and extend patterns of them.</p> <p>Identify patterns and rules for addition greater</p>	<p>Explain the conditions required for a number to be odd or even and identify them.</p> <p>Identify and describe repeating patterns using two or more attributes, growing and shrinking patterns in numbers.</p> <p>Analyse, recognize, describe, represent and extend more complex patterns in numbers.</p> <p>Understand and use number patterns to solve problems.</p> <p>Introduction of multiplications (1x, 2x, 3x, 4x, 5x, 9x, 10x)</p> <p>Understand that adding: <math>2 + 3 = 5</math> is the same as <math>3 + 2 = 5</math> Also: <math>(2+3)+4=2+(3+4)</math></p> <p>Understand that multiplication is repeated addition</p>	<p>Investigate and use the properties of odd and even numbers.</p> <p>Identify patterns and rules for multiplication and division and addition and subtraction i.e. Fact families.</p> <p>Understand and use number patterns to make predictions and solve problems.</p> <p>Expose to rules for adding, subtracting and multiplying odd and even numbers, i.e. <math>\text{even} + \text{even} = \text{even}</math>, <math>\text{odd} + \text{odd} = \text{even}</math>, <math>\text{odd} + \text{even} = \text{odd}</math>.</p> <p>Describe, continue and create patterns involving whole numbers.</p> <p>Identify a sequence of operations to relate 1 set of numbers to another.</p> <p>Understand that patterns can be</p>	<p>Predict the next term in a pattern.</p> <p>Use the properties of the 4 operations to solve problems.</p> <p>Understand and use the relationship between multiplication and addition.</p> <p>Understand and use the relationship between division and subtraction.</p> <p>Use real-life problems to create, model and explain a number pattern.</p> <p>Describe, continue and create patterns involving simple fractions, decimals and whole numbers.</p> <p>Select and use appropriate methods for representing patterns e.g. Using words, symbols, numbers, and tables.</p>	<p>Understand that patterns can be generalized by any rule.</p> <p>Use the inverse relations between <math>\times</math> and <math>\div</math>, <math>+</math> and <math>-</math>.</p> <p>Solve problems by beginning to suggest and test hypotheses and construct simple expressions and formulae/functions in words and symbols.</p> <p>Select and use appropriate methods for representing patterns e.g. using words, symbols, numbers, and tables.</p> <p>Understand the relationship between square and square roots.</p> <p>Know square numbers to 12.</p> <p>Find multiples and factors of numbers to 50.</p> <p>Consolidate and find patterns to identify prime numbers.</p> <p>Identify and describe factors and multiples of whole numbers and use them to solve problems.</p> <p>Describe, continue and create patterns with fractions, decimals and whole numbers resulting</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
				<p>than 10 (number bonds)</p> <p>Skip counting using patterns in 1, 2, 5 and 10.</p>	<p>and division is repeated subtraction.</p>	<p>analysed and rules can be identified.</p> <p>Describe rules in a variety of ways.</p> <p>Represent rules for patterns using, words, symbols, numbers and tables.</p>		<p>from addition and subtraction.</p> <p>Find pairs of numbers that satisfy a problem with 2 unknowns or variables e.g. <math>(20 \times \_ = \_ + 10)</math></p>

# MEASUREMENTS

To measure is to attach a number to a quantity using a chosen unit. Since the attributes being measured are continuous, ways must be found to deal with quantities that fall between numbers. It is important to know how accurate measurement needs to be or can ever be.

## Overall Expectation

Phase 1	Phase 2	Phase 3	Phase 4
<p>Learners will develop an understanding of how measurement involves the comparison of objects and the ordering and sequencing of events. They will be able to identify, compare and describe attributes of real objects as well as describe and sequence familiar events in their daily routine.</p>	<p>Learners will understand that standard units allow us to have a common language to measure and describe objects and events and that while estimation is a strategy that can be applied for approximate measurements; particular tools allow us to measure and describe attributes of objects and events with more accuracy. Learners will develop these understandings of measurement involving length, mass, capacity, money, temperature and time.</p>	<p>Learners will continue to use standard units to measure objects, developing their understanding of measuring perimeter, area and volume. They will select and use appropriate tools and units of measurement and will be able to describe measures that fall between two numbers on a scale. The learners will be allowed to construct meaning about the concept of an angle as a measure of rotation.</p>	<p>Learners will understand that a range of procedures exists to measure different attributes of objects and events, for example, the use of formulae for finding area, perimeter and volume. They will be able to decide on the level of accuracy required for measuring and using decimal and fraction notation when precise measurements are necessary. To demonstrate their understanding of angles as a measure of rotation, the learners will be able to measure and construct angles.</p>

## Conceptual understandings and Grade level indicators

<p>Measurement involves comparing objects and events.</p> <p>Objects have attributes that can be measured using non-standard units.</p>	<p>Standard units allow us to have a common language to identify, compare, order and sequence objects and events.</p> <p>We use tools to measure the attributes of objects and events.</p>	<p>Objects and events have attributes that can be measured using appropriate tools.</p> <p>Relationships exist between standard units that measure the same attributes.</p>	<p>The accuracy of measurements depends on the situation and the precision of the tool. Conversion of units and measurements allows us to make sense of the world we live in. A range of procedures exists to measure different attributes of objects and events.</p>
---	--	---	---

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
Events can be ordered and sequenced.								
			Estimation allows us to measure with different levels of accuracy.					
<b>Measurements</b>	<p>Identify, describe and compare the attribute of length using everyday language (long, longer, short, shorter, big, small)</p> <p>Identify, describe and compare the attributes of volume and capacity (full, empty).</p> <p>Identify, describe and compare the attributes of mass (lighter, heavier).</p>	<p>Understand attributes of real objects can be compared and described (longer, shorter, heavier, lighter, empty, full, hotter, colder).</p> <p>Measure using different sized non-standard units of measure.</p> <p>Estimate and compare length, volume (capacity), mass, and time using non-standard units of measurement.</p>	<p>Estimate, measure and compare using non-standard and standard (cm, m) units of measurement. Use direct and indirect comparisons to decide which is longer, heavier or holds more and explain reasoning in everyday language.</p> <p>Start using mathematical language relating to measurement (i.e. long, wide, volume, temperature and time).</p> <p>Use and explore standard (cm, m) and non-standard units of measurement: length, mass, volume and time.</p>	<p>Understand, estimate and measure items, using non-standard and standard units of measurement for length, height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring containers.</p> <p>Compare and order items and place in order from shortest to longest; lightest to heaviest.</p>	<p>Understand that tools can be used to estimate, measure and compare using standard and non-standard units of measurement (length, time, weight, volume/capacity, temperature)</p> <p>Real life: Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p> <p>Understand how many cm in m, m in km, g in kg, ml in l and start making simple conversions.</p>	<p>Use scaled instruments to measure, order and compare objects using standard units of measurement: length, mass, time and temperature: know the meaning of “kilo”, “centi” and “milli”.</p> <p>Convert between different units of measure (km to m; hour to min)</p> <p>Measure the perimeter of simple 2-D shapes using standard and non-standard units of measurement and by counting the squares for a rectilinear figure.</p> <p>Select appropriate tools and units of measurement.</p> <p>Describe and understand measures that fall between numbers</p>	<p>Understand and use scaled instruments to measure and compare lengths, masses, capacities and temperatures and use the appropriate standard units of measurement</p> <p>Describe and understand measures that fall between numbers on a measuring scale.</p> <p>Compare objects using familiar metric units for area and volume.</p> <p>Calculate the perimeter and area of rectangles using familiar metric units and written formulae.</p> <p>Recognise that shapes with the same areas can have different</p>	<p>To accurately interpret scales on a range of measuring instruments.</p> <p>Use fractions and decimals when measuring.</p> <p>Choose appropriate units of measurement for length, area, volume, capacity and mass.</p> <p>Convert between units to two decimal places (i.e. mm/cm/m/km, ml/l, mg/g/kg).</p> <p>Calculate, estimate and compare the volume of cubes and cuboids using arrays, given whole number dimensions and written formulae using standard units (cm<sup>3</sup> and m<sup>3</sup>).</p> <p>Calculate the area of right-angled triangles.</p> <p>Illustrate and name parts of circles, including radius, diameter and</p>



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
		Compare the capacities of two containers using direct comparison (full, empty)				<p>on a measuring scale.</p> <p>Measure and calculate the perimeter and area of a rectilinear figure (including squares) in cm and m, by counting the squares and by moving towards using a written formula.</p> <p>Understand that angles are part of a rotation.</p> <p>Classify angles as acute, obtuse, right, straight lines or reflex angles.</p> <p>Identify right angles and angles greater than and less than</p>	<p>perimeters and vice versa.</p> <p>Compare and calculate the perimeter and area of regular and irregular shapes (compound shapes) also using a formula.</p> <p>Understand the relationship and convert between different units of metric measure (i.e. km - m; cm - m; cm - mm; g - kg; l - ml).</p> <p>Understand that angles are part of a rotation.</p> <p>Classify angle measures as acute, obtuse, right angle, straight line or reflex using a protractor.</p>	<p>circumference and know that the diameter is twice the radius.</p> <p>Understand the relationship and convert between different units of metric measure (i.e. km - m; cm - m; cm - mm; g - kg; l - ml).</p> <p>Construct, estimate, measure and compare angles using a protractor to the nearest degree.</p> <p>Draw 2D shapes using given dimensions and angles.</p>
<b>Time</b>	Identify and describe when events or activities occur (morning, afternoon, night, before, after, bedtime,	Begins to use the language of the time (i.e. o'clock, hours, knowing the	Sequence days of the weeks and identify months of the year.  Use a calendar to identify a sequence of dates, days and months.	Understand and use a calendar to determine the date, and to identify and sequence days of the week and months of the year and seasons.	Use a calendar to identify the date and determine the number of days in each month, year and leap year.  Read and write analogue and	Begin to read, write and convert time between analogue and digital 12- and 24-hour clocks.  Read and comprehend calendars.	Read, write and convert time between analogue and digital 12- and 24-hour clocks.  Read and write time to the nearest 2 minutes.	Compare 12- and 24-hour time systems and convert between them.  Solve problems involving time zone changes and timetables.

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
	<p>storytime, today, tomorrow, and yesterday).</p>	<p>sequence of the day etc.)</p> <p>Sequence events in chronological order using language (i.e. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening).</p> <p>Understand that time is measured using universal units of measure.</p>	<p>Recognise and use language relating to dates, including days of the week, weeks, months and years.</p> <p>Begin to estimate, identify and compare lengths of time: second, minute, hour, day, week and month.</p> <p>Begin to understand and read time to the hour and half hour and draw the hands on a clock face to show these times.</p>	<p>Read and write analogue time to the hour, half-hour and quarter-hour.</p> <p>Compare lengths of time: minute, hour, day, week, month.</p> <p>Know the number of minutes in an hour and the number of hours in a day.</p> <p>Estimate, identify and compare lengths of time: second, minute, hour, day, week and month.</p> <p>Understand and read time to the hour and half hour and draw the hands on a clock face to show these times.</p>	<p>digital time to the nearest quarter hour, half-hour and hour, also using the language of 'past' and 'to'.</p> <p>Understand the relationship between days, weeks, months and years.</p> <p>Knowing the number of seconds in a minute.</p> <p>Record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight.</p>	<p>Investigate the relationship between units of time by using everyday measurement instruments.</p> <p>Measure duration of time using digital technologies and record as minutes and seconds.</p> <p>Understand that AM times are from midnight until midday and PM are from midday to midnight.</p> <p>Solve problems involving converting from hours to minutes, minutes to seconds, years to months, and weeks to days.</p>	<p>Use am and pm notation and solve time problems.</p> <p>Estimate and identify lengths of time i.e. 10 seconds, 1 minute, 10 minutes.</p> <p>Use and construct timetables on 12 and 24-hour clocks and timelines.</p> <p>Solve problems involving converting between units of time.</p>	<p>Use timelines in real-life applications.</p> <p>Read and write time to the nearest minute.</p> <p>Consolidate time conversions.</p> <p>Know and convert between varied units of time that include sec-min-h; h-day, day-week, day - year and year - centuries.</p> <p>Estimate and identify lengths of time to the nearest second.</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
--	------	------	------	---------	---------	---------	---------	---------

# DEUTSCHE

## SHAPE and SPACE

The regions, paths and boundaries of natural space can be described by shape. An understanding of the interrelationships of shape allows us to interpret, understand and appreciate our two-dimensional (2D) and three-dimensional (3D) world.

### Overall Expectation

Phase 1	Phase 2	Phase 3	Phase 4
Learners will understand that shapes have characteristics that can be described and compared. They will understand and use a common language to describe paths, regions and boundaries of their immediate environment.	Learners will continue to work with 2D and 3D shapes, developing the understanding that shapes are classified and named according to their properties. They will understand that examples of symmetry and transformations can be found in their immediate environment. Learners will interpret, create and use simple directions and specific vocabulary to describe paths, regions, positions and boundaries of their immediate environment.	Learners will sort, describe and model regular and irregular polygons, developing an understanding of their properties. They will be able to describe and model congruency and similarity in 2D shapes. Learners will continue to develop their understanding of symmetry, reflective and rotational symmetry. They will understand how geometric shapes and associated vocabulary are useful for representing and describing objects and events in real-world situations.	Learners will understand the properties of regular and irregular polygons. They will understand the properties of 2D shapes and understand that 2D representations of 3D objects can be used to visualize and solve problems in the real world, for example, using drawing and modelling. Learners will develop their understanding of the use of scale (ratio) to enlarge and reduce shapes. They will apply the language and notation of bearing to describe direction and position.

### Conceptual understandings and Grade level indicators



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
<p>Shapes can be described and organized according to their properties.</p> <p>Objects in our immediate environment have a position in space that can be described according to a point of reference.</p>			<p>Shapes are classified and named according to their properties.</p> <p>Some shapes are made up of parts that repeat in some way.</p> <p>Specific vocabulary can be used to describe an object's position in space.</p>		<p>Changing the position of a shape does not alter its properties.</p> <p>Shapes can be transformed in different ways.</p> <p>Geometric shapes and vocabulary are useful for representing and describing objects and events in real-world situations.</p>		<p>Manipulation of shape and space takes place for a particular purpose.</p> <p>Consolidating what we know of geometric concepts allows us to make sense of and interact with our world.</p> <p>Geometric tools and methods can be used to solve problems relating to shape and space.</p>	
Shape	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
	<p>Show awareness of similarities of shapes in the environment. Beginning to talk about shapes of everyday objects. Using for e.g. 'round' and 'tall'.</p> <p>Beginning to talk about 3D shapes within everyday objects, using for e.g. 'round', 'ball' and 'tall'.</p>	<p>Describe in their own words the overall size, shape, function and/or features of 2D shapes in their environment (i.e. circle, square, rectangle, triangle).</p> <p>Begin to investigate, name and describe solids (3D) - cube, sphere and cone.</p> <p>Sort, describe, compare and match 3D objects, talking about</p>	<p>Recognise familiar 2D shapes and 3D objects in the environment and their relationship with each other.</p> <p>Classify 2D shapes according to shape, size and colour.</p> <p>Sort and label 2D and 3D shapes using appropriate mathematical vocabulary: sides, corners, circle, sphere, square and cube.</p> <p>Sort, describe, compare and name 3D shapes according to attributes such as size and form (cube, cuboid, sphere, prism and cone).</p>	<p>Recognise 2D shapes and 3D objects.</p> <p>Classify 2D shapes by the number of sides and corners they have.</p> <p>Classify and compare 3D objects according to the number of faces (edges and vertices) they have.</p> <p>Sort, analyse and label 2D and 3D shapes using appropriate mathematical vocabulary, sides, corners, circle, sphere, square and cube.</p>	<p>Sort, describe (using common language), draw, label, analyse and model regular and irregular 2D polygons and 3D figures by geometric properties (number of sides, vertices, number and shape of faces).</p> <p>Understand the connection between 2D shapes and 3D objects.</p> <p>Identify 2D shapes in objects and structures around them and consider why the given shape is suitable for its purpose (i.e.</p>	<p>Classify, analyse and compare 2D shapes and 3D objects according to features and develop geometric language such as side, corner, face, edge, vertex, curved and straight.</p> <p>Make models of 3D objects and describe key features.</p> <p>Understand properties, analyse, sort, describe and model 2D and 3D shapes also including regular and irregular polygons.</p> <p>Understand and use the vocabulary of lines, parallel and perpendicular.</p>	<p>Identify, describe and construct 2D and 3D shapes by the following characteristics, number of sides and angles.</p> <p>Compare and describe 2D shapes that result from combining and splitting common shapes.</p> <p>Analyse, describe and draw regular and irregular polygons.</p> <p>Recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>Draw two-line segments and</p>	<p>Analyse, describe and visualise 2D and 3D shapes by their spatial features.</p> <p>Model 3D objects (and draw on isometric paper).</p> <p>Understand the properties of regular and irregular polygons.</p> <p>Connect 3D objects with their nets and other 2D representations.</p> <p>Use a scale to enlarge and reduce 2D shapes.</p> <p>Create 2D drawings (front, side, top view) of 3D models and be able to recreate the model when given drawings of it.</p> <p>Estimate, measure and draw angles up to 360</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
		<p>decisions made.</p> <p>Use shapes to make models, patterns and pictures.</p> <p>Talk about 3D shapes within everyday objects, using e.g. 'round', 'ball' and 'tall'.</p>	<p>Sort, describe, compare, name and create 2D shapes according to attributes such as size or form (circle, square, triangle, rectangle, oval and pentagon).</p> <p>Understand that 2D &amp; 3 D can be related by putting together or taking apart other shapes.</p>	<p>Create 2D shapes.</p> <p>Identify 2-D shapes on the surface of 3-D shapes, (i.e. a circle on a cylinder and a triangle on a pyramid).</p> <p>Understand how real-world ideas can be represented using geometric shapes.</p>	<p>wheels are circular so they roll freely).</p> <p>Draw 2D shapes and make 3D shapes using modelling materials; recognise 2D and 3D shapes in different orientations and describe them.</p> <p>Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.</p>	<p>Introduce and start to identify right angles and angles greater than and less than 90°.</p> <p>Describe and represent mental images of an object, patterns and paths.</p> <p>Understand an angle as a measure of rotation by comparing and describing rotations: whole turn, half turn, quarter turn, north, south, east and west on a compass.</p>	<p>identify them as parallel or perpendicular.</p> <p>Understand and use the vocabulary of the types of angles: obtuse, acute, right, straight and reflex angle.</p> <p>Understand that an angle is a measure of rotation.</p> <p>Know that angles are measured in degrees and that one whole turn is 360 degrees and apply rotational knowledge to practical situations.</p> <p>Analyse angles by comparing and describing rotations: whole turn; half turn; quarter turn; north, south, east and west on a compass.</p>	<p>degrees using a protractor and or written method.</p> <p>Know key angle facts and use them to solve missing angle problems:</p> <ul style="list-style-type: none"> <li>- Angles in a circle total 360 degrees</li> <li>- Angles on a straight-line total 180 degrees</li> <li>- Angles in a triangle total 180 degrees</li> <li>- Angles in a quadrilateral total 360 degrees.</li> </ul>
<b>Transformation</b>			<p>Find and explain symmetrical designs in their immediate environment.</p>	<p>Create translations of a shape along a line, for example repeating a potato print</p>	<p>Identify symmetry in the environment.</p> <p>Identify and create symmetrical patterns</p>	<p>Find more than one line of symmetry in regular shapes.</p> <p>Recognise, create and explain symmetrical</p>	<p>Understand that changing the position of a shape does not alter its properties.</p>	<p>Understand, describe and perform translations, reflections and rotational symmetry of 2D shapes.</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
			Create and explains simple symmetrical designs/patterns.	<p>across the top border of a page.</p> <p>Find and explain symmetry in their immediate environment.</p> <p>Identify and find a line of symmetry.</p> <p>Recognise and use whole, half and quarter turn.</p> <p>Create and explain simple symmetrical designs.</p>	<p>Find the line of symmetry in regular shapes.</p> <p>Identify lines of reflective symmetry.</p> <p>Describe the effect of one-step flips and slides of 2D shapes.</p> <p>Understand clockwise and anti-clockwise.</p>	<p>designs in the environment.</p> <p>Physically move shapes to predict the location and orientation of the shape after it has been translated, reflected or rotated, e.g. draw/show what this shape will look like if I give it a half turn about its centre.</p> <p>Solve problems involving transformations.</p>	<p>Describe the transformations (reflection, rotation, translation, or enlargement) that have mapped one object onto another.</p> <p>Recognise and explain symmetrical patterns, including tessellation, in the environment.</p>	<p>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p> <p>Enlarge familiar 2D shapes and explore the properties of the resulting image compared with the original.</p> <p>Be able to compare the image of a shape with the original and describe the transformation (reflection, rotation or translation). This can include a sequence of two transformations.</p>
<b>Position and Orientation</b>	Understand and use positional language, e.g. inside, outside, above, below, next to, behind, in front of.	<p>Introduce and describe position vocabulary - besides, behind, below, above, between, on, under, inside, next to, outside, in front.</p> <p>Use everyday words to describe direction (forwards,</p>	<p>Consolidate position vocabulary - under, over, above, next to, between, in front of, behind, inside, outside, left and right.</p> <p>Give, follow, describe and explain simple directions, describing paths, regions and boundaries of their immediate environment and their position: left, right, forward, backwards, inside,</p>	<p>Give and follow simple instructions involving position, direction and movement; left, right, forwards, backwards, diagonally forward and diagonally backwards.</p> <p>Give, follow, describe and explain simple directions,</p>	<p>Understand, interpret, create and use simple schematic maps (i.e. plans of their school, road maps of their local area) to show current position and simple directions.</p> <p>Describe different views and pathways from locations on a map.</p>	<p>Create and interpret simple grid maps to show position and pathways.</p> <p>Use simple coordinates (i.e. B5) to specify locations on schematic maps.</p> <p>Interpret and create simple directions, describing paths, regions, positions and boundaries of their immediate environment.</p>	<p>Use simple scales and directions to interpret the information contained in basic maps.</p> <p>Locate features on a grid using coordinates.</p> <p>Find the place that matches a given point on the map and describe how they would move from one point to another, include</p>	<p>Use a grid reference system that is used on maps to specify location and direction.</p> <p>Read and plot coordinates in four quadrants</p> <p>Use features of a map to describe the movement that would get someone from one location to another, including distance and direction; also includes turns (right, left relative to</p>

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
		sideways, backwards, up, down)	outside, above, below, next to, behind, in front of.	describing paths, regions and boundaries of their immediate environment and their position: left, right, forward, backwards, inside, outside, above, below, next to, behind, in front of.	Locate features on a grid using simple coordinates.  Recognise and use whole, half and quarter turn (clockwise and anticlockwise).  Represent ideas about the real world using geometric shapes, vocabulary and symbols through oral, drawings, modelling and labels.	Describe positions on a 2D grid as coordinates in the first quadrant.  Plot specified points and draw sides to complete a given polygon.  Describe movements between positions as translations of a given unit to the left/right and up/down.	features such as main compass directions (N, S, E, W), half and quarter turns, and approximate distances in whole numbers of meters (i.e. about 12 m).  Read and plot coordinates in the first 2 quadrants.	orientation), main compass directions (N, NW, NE, S, SW, SE, W, E) and approximate distances in m or km. Follow a set of directions given in terms of turns and distances (as above) and show that path they walked on a map of the area.

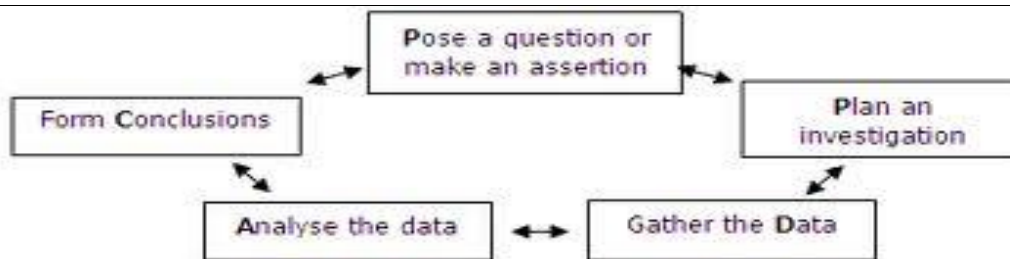
## DATA HANDLING

Data handling allows us to make a summary of what we know about the world and to make inferences about what we do not know.

- Data can be collected, organized, represented and summarized in a variety of ways to highlight similarities, differences and trends; the chosen format should illustrate the information without bias or distortion.
- Probability can be expressed qualitatively by using terms such as “unlikely”, “certain” or “impossible”. It can be expressed quantitatively on a numerical scale.



	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
--	------	------	------	---------	---------	---------	---------	---------



### Overall Expectation

Phase 1	Phase 2	Phase 3	Phase 4
Learners will develop an understanding of how the collection and organization of information help to make sense of the world. They will sort, describe and label objects by attributes and represent information in graphs including pictographs and tally marks. The learners will discuss chances in daily events.	Learners will understand how information can be expressed as organized and structured data and that this can occur in a range of ways. They will collect and represent data in different types of graphs, interpreting the resulting information to answer questions. The learners will develop an understanding that some events in daily life are more likely to happen than others and they will identify and describe likelihood using appropriate vocabulary.	Learners will continue to collect, organize, display and analyse data, developing an understanding of how different graphs highlight different aspects of data more efficiently. They will understand that scale can represent different quantities in graphs and that mode can be used to summarize a set of data. The learners will make the connection that probability is based on experimental events and can be expressed numerically.	Learners will collect, organize and display data for the purposes of valid interpretation and communication. They will be able to use the mode, median, mean and range to summarize a set of data. They will create and manipulate an electronic database for their own purposes, including setting up spreadsheets and using simple formulas to create graphs. Learners will understand that probability can be expressed on a scale (0–1 or 0%–100%) and that the probability of an event can be predicted theoretically.

### Conceptual understandings and Grade level indicators

We collect information to make sense of the world around us.	Information can be expressed as organized and structured data.	Data can be collected, organized, displayed and analysed in different ways.	Data can be presented effectively for valid interpretation and communication.
Organizing objects and events helps us to solve problems.	Objects and events can be organized in different ways.	Different graph forms highlight different aspects of data more efficiently.	Range, mode, median and mean can be used to analyse statistical data.
Events in daily life involve chance.	Some events in daily life are more likely to happen than others.	Probability can be based on experimental events in daily life.	The probability of an event can be predicted theoretically.

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
Data	Collect data about themselves and their surroundings.  Sort objects by attribute and	Understand the purpose of collecting data.  Answer yes/no questions to	Create a tally, pictograph and simple bar graph of real objects and interpret data by comparing quantities: more,	Understand that information about themselves and their surroundings can be collected	Understand that data is information gathered to answer questions and solve problems.  Collect, organise and present	Design, survey, systematically collect and display data using Venn and Carroll diagrams, tables, tally charts,	Design and survey and systematically collect, organize and display data in line graphs and bar graphs.	Identifying patterns and trends in context, within and between data sets.  Communicating findings, using data displays.

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
	organise them into tally marks and pictographs.	<p>collect information.</p> <p>Sort, order and label real objects into sets by one attribute.</p> <p>Place objects on concrete graphs and contribute to / talk about class pictographs.</p> <p>Understand that sets can be organised in different attributes.</p>	<p>fewer, less than, greater than.</p> <p>Sort, order and label objects with one or more than one attribute.</p> <p>Choose simple questions and gather responses.</p> <p>Identify, compare and describe quantities of collected data (tally and bar) to solve simple problems (most/least).</p> <p>Sort, order and label real objects into sets by more than one attribute and present them in a tree, Carroll and Venn-diagram.</p> <p>Graph real objects, and compare and describe them by attributes.</p> <p>Create living graphs by using objects and people.</p>	<p>and recorded in different ways.</p> <p>Create a tree, Venn, Carroll diagram, pictograph and a simple bar graph.</p> <p>Choose questions and gather responses.</p> <p>Express the relationship between data.</p> <p>Display and interpret data to find information.</p> <p>Interpret data by comparing categories (find similarities and differences): more, fewer, less than, greater than (i.e. "6 more people like chocolate ice cream than vanilla").</p>	<p>displays of data using lists, tables, tally charts, Venn and Carroll diagrams and picture graphs and interpret them.</p> <p>Discuss, compare and interpret data (i.e. tree, Venn and Carroll diagram).</p> <p>Interpret data by comparing quantities, more, fewer, less than, and greater than.</p>	<p>pictographs and simple bar graphs.</p> <p>Identify questions or issues for categorical variables.</p> <p>Identify data sources and plan methods of data collection and recording.</p> <p>Determine whether the chosen graph form best shows patterns in the data.</p> <p>Use and understand the scale on a vertical axis of a bar graph to represent large quantities.</p> <p>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</p>	<p>Select the appropriate graph form to display data.</p> <p>Interpret and communicate results through reference to data displays with an emphasis on similarity and difference.</p> <p>Evaluate the effectiveness of different displays in illustrating data features including variability.</p> <p>Read, identify and interpret the range and scale on the graph.</p> <p>Create and interpret pictographs, bar graphs, line graphs and pie charts.</p> <p>Create and correctly label graphs.</p> <p>Identify the mode for a set of data. Understand that the mode, median, range and mean can summarise a set of data.</p>	<p>Pose questions and collect categorical or numerical data by observation or survey.</p> <p>Construct displays, including line graphs, dot plots and pie graphs.</p> <p>Collect, organise, present and interpret data in a variety of forms, including pie and line graphs.</p> <p>Understand that different graphs have different purposes.</p> <p>Find and explain mode, median, range and mean (mean as an average) from a set of data.</p> <p>Describe key features of data, draw conclusions from similar data from different groups and make general predictions based on results.</p>
<b>Probability</b>	Describe possible	Describe possible	Begin to discuss outcomes using terms such as	Identify outcomes of familiar events	Identify practical activities and everyday events	Consider the possible outcomes of events in predicting what might occur and recognise	Understand that there is a difference between practical	List outcomes of chance experiments involving equally likely outcomes and represent

	KG 1	KG 2	KG 3	Class 1	Class 2	Class 3	Class 4	Class 5
	<p>outcomes in everyday situations (can't, maybe, can, certain, impossible)</p>	<p>outcomes in everyday situations (can't, maybe, can, certain, impossible)</p> <p>Discuss chance in simple daily events (will happen, won't happen, might happen).</p>	<p>impossible, less likely, unlikely, maybe, likely, most likely and certain.</p> <p>Begin to predict, discuss and order the chance of an event happening using terms such as impossible, less likely, unlikely, maybe, likely, most likely and certain.</p>	<p>involving chance and describe them using everyday language such as impossible, less likely, unlikely, maybe, likely, most likely and certain.</p>	<p>that involve chance.</p> <p>Describe outcomes as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible'.</p> <p>Determine fair and unfair games</p> <p>To recognize situations where outcomes are certain, impossible or unpredictable.</p>	<p>when outcomes appear to be equally likely (i.e. getting an even number when rolling a die).</p> <p>Recognise that where an event has more than one possible outcome they cannot predict the outcome with certainty (i.e. it probably won't be a six but it might be when rolling a dice)</p> <p>Use probability to determine mathematically fair games and to explain possible outcomes.</p> <p>Use a numerical probability scale of 0-1 or 0% to 100% to determine the probability of events.</p> <p>Use a tree diagram to express probability with simple fractions.</p>	<p>and theoretical problems.</p> <p>Identify everyday events where one cannot happen if the other happens.</p> <p>Understand and use a numerical probability scale of 0-1 or 0% to 100% to determine the probability of events.</p> <p>Identify events where the chance of one will not be affected by the occurrence of the other.</p> <p>Identify the possible outcomes of events in predicting what might occur and recognise when outcomes appear to be unequally likely (i.e. is it more possible to roll a 1 or a 7 when rolling two 6-sided dice).</p> <p>Express probability using simple fractions.</p>	<p>probabilities of those outcomes using fractions and percentages.</p> <p>Use systematic methods such as listing, tree diagrams, or tables to find all the possible outcomes of simple situations such as tossing coins, drawing cards, or rolling dice and make statements based on results.</p> <p>Express probability using a numerical probability scale.</p> <p>Determine the theoretical probability of any event and express why it might differ from experimental and practical probability.</p>