

HfL Assessment Criteria for Mathematics

This document includes guidance on the progression of skills in maths, organised into these areas:

- Working mathematically
- Number
- Measurement, geometry and statistics

Judgements about the 'step' in which children are working need to take into account all these aspects of mathematics.

Knowledge and understanding in Number carries the most weight (about 60-75% of the overall judgement); however, it is important to develop the other aspects of mathematics as well, to ensure a good level of development in the subject.

Fluency focus – each set of criteria includes a fluency focus, which states the complexity of numbers children should be using for all the aspects of their number work. If children are not able to work with the numbers stated in the fluency focus, they should be assessed as working at a lower step.

In general, the approach to deciding the 'step' in which child is working is as follows:

- consider which skills the child has shown evidence of working securely i.e. the skill has been seen applied in a range of different situations
- evaluate the overall proportion of the skills listed on the assessment sheet that have been achieved and determine the 'step':
(using the example of steps A1/2/3 – based on curriculum expectations for Y1)
 - at least 25% of skills, up to 60% (including 25-60% of Number skills) = A1
 - between 60-80% of skills (including 60-80% of Number skills) = A2
 - between 80-100% of skills (including 80-100% of Number skills) = A3

To be working within the age-related expectation step there should also be evidence that the pupil is using many of the skills shown on the 'Working mathematically' sheet for the appropriate phase.

To be working beyond the age-related expectation step there should also be evidence that the pupil is using most of the 'Working mathematically' skills for the appropriate phase.

In the first year of that phase (e.g. Year 1 in Phase A), children will be beginning to use those skills, within the context of that year's curriculum; in the second year (e.g. Year 2 in Phase A), children should be consolidating and securing those skills. To be considered to have 'mastered' the curriculum in that phase, pupils would be expected to be securely using the 'Working mathematically' skills, as well as being secure across the aspects of Number, Measurement, Geometry and Statistics.

Throughout this document, references to the KS1 and KS2 mathematics test frameworks (produced by the Standards & Testing Agency) have been made in brackets e.g. 1N1a

NB Algebra – although algebra is not explicitly shown in the National Curriculum in KS1 or lower KS2, we have included the key algebraic aspects of number that should be developed in each year group, in order to prepare children for end of KS2 expectations.

Application	Key Stage One ('Phase A')	Lower Key Stage Two ('Phase B')	Upper Key Stage Two ('Phase C')
Ideas, questions and lines of enquiry	- selects the mathematics they use in an increasing range of classroom activities <i>adopts a suggested model or systematic approach</i> <i>makes connections and applies knowledge to similar situations</i> - chooses equipment appropriate to the task with support - asks simple questions relevant to the problem and begins to suggest ways of exploring	- develops the mathematics they use in a wide range of contexts <i>makes suggestions of ways to tackle a range of problems</i> <i>makes connections to previous work</i> - chooses equipment appropriate to the task independently <i>poses and answers questions related to a problem and suggests a range of possible approaches to the solution</i>	- identifies and obtain necessary information to carry through a task and solve mathematical problems <i>recognises when information is or is not crucial to the solving of a problem</i> <i>determines what is missing and develops lines of enquiry</i> - selects the most appropriate equipment and explains choices - uses their mathematical experiences to explore ideas and raises questions to pursue further lines of enquiry
Represent and communicate	- describes a problem in their own words e.g. <i>acts it out</i> <i>represents the problem pictorially or with concrete resources</i> - begins to develop own ways of recording <i>uses and interprets familiar mathematical symbols and diagrams</i> - begins to organise work and check results <i>shows evidence of method in responses</i> - discusses their mathematical work and begins to explain their thinking using appropriate mathematical vocabulary	- represents problems pictorially, using a model or with concrete resources <i>restates the problem in another way</i> - presents work in a clear and organised way <i>uses and interprets a wide range of mathematical symbols and diagrams</i> - begins to work in an organised way from the start using strategies such as recording results in order and checks for accuracy - discusses their mathematical work and uses mathematical language in a more precise and accurate way	- shows understanding of situations by describing them mathematically using symbols, words and diagrams - decides how best to represent conclusions, using appropriate recording <i>begins to understand and use formulae and symbols to represent problems</i> - organises work from the outset, looks for ways to record systematically and checks results to see if they are reasonable <i>checks for and spots errors while working</i> - constructs complex explanations and reasoned arguments
Plan an approach and implement it	understands and uses known facts and procedures to solve simple problems	uses facts and procedures to solve simple and more complex problems	understands and uses facts and procedures creatively to solve complex or unfamiliar problems

	- uses familiar strategies and operations to solve problems within known mathematical concepts and procedures - tries different approaches and finds ways of overcoming difficulties when solving problems – sometimes with support	- develops own strategies for solving problems and applying mathematics to practical contexts - finds solutions that match the context of the problem	- uses appropriate mathematical concepts, processes, skills and tools to solve a problem - interprets the mathematical solution in the context of the problem and makes sense of the solution
Computational complexity (Within the range of number facts known)	solves problems with one or a small number of steps, where all steps are simple	solves problems with more than one step at least one of which is more complex	solves problems with a larger number of numeric steps, at least one of which is more complex

Reasoning	Key Stage One ('Phase A')	Lower Key Stage Two ('Phase B')	Upper Key Stage Two ('Phase C')
Make connections	- recognises similarities to previous work through classroom discussion - begins to use familiar elements of knowledge to tackle problems that are more unfamiliar or complex - poses 'What if?' questions during practical problem solving opportunities	- makes connections to previous work within mathematics and with other subjects - poses and answer questions that will help make sense of the problem - poses 'What if?' questions that may change the outcome or direction of the problem	- poses own questions and create problems for peers that are similar to ones worked on in class - develops own lines of enquiry
Evaluate	reviews their work by explaining why they have done something	suggests refinements to elements of problem solving by comparing other approaches and against 'modelled' examples	considers efficiency of methods and adapts work accordingly throughout problem solving activities
Draw conclusions	- predicts an answer or outcome e.g. <i>numbers in an extended sequence</i> - talks about findings by referring to own work - explains why an answer is correct - begins to make simple inferences when referring to own work	- predicts conclusions and reason why when referring to work - comments on whether the conclusion was expected - makes valid inferences when referring to own work	- conjectures to develop own line of enquiry when testing outcomes - draws own valid conclusions and give an explanation of reasoning (including written explanations)

Generalise	- understands a general statement by finding a particular example that match it - begins to describe a pattern or sequence in words or using concrete resources or own representation	- finds solutions and makes predictions by identifying patterns when working - forms generalised rules in words, using concrete resources or own representation	identifies more complex patterns and begins to express generalisations using symbolic notation
Justify	provides simple reasons for opinions	justifies answers and solutions by referring to their work and support with examples	- justifies methods chosen and why the solution is the best one or not - supports conclusions with examples and counter examples

Problem solving strategies	Key Stage One ('Phase A')	Lower Key Stage Two ('Phase B')	Upper Key Stage Two ('Phase C')
	- sorts information - uses 'guess and check' strategy to solve unfamiliar problems - begins to look for patterns in results while working and uses them to find other possible outcomes - draws simple pictures or diagrams - gives examples to match statements and ones that do not - finds a starting point	- identifies irrelevant information; uses lists and tables to identify and organise information - uses informed 'guess and check' - seeks a pattern - draws a diagram or model - seeks an exception - breaks the problem down into simpler steps - e.g. <i>works backwards</i>	- organises, deconstructs and prioritises information; uses systematic lists and tables to identify information - uses informed 'guess, check and improve' - identifies and uses a pattern - draws a mathematical model to support visualisation of problem - uses and applies negative proof (uses counter argument to prove the rule) - uses a structured approach to tackle the problem (devise a plan) - e.g. <i>works backwards</i> - solves a simpler related problem

HfL Assessment Criteria for Phase A Steps 0/1/2/3 (based on curriculum expectations for Year 1)	
Maths – Number	
Understanding the number system	Calculating
Fluency Focus: Numbers up to 100 through a wide variety of models and representations - counts to and across 100, forward and backwards, beginning with 0 or 1, or from any given number (1N1a) - counts, reads and writes numbers to 100 in numerals (1N2a) and numbers 1-20 in words (1N2c) <i>pupils practise counting (1, 2, 3..), ordering (for example, first, second, third), or to indicate a quantity (for example, 3 apples, 2 centimetres)</i> - finds one more and one less (1N2b) - counts in multiples of twos, fives and tens (1N1b) - identifies and represents numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least (1N4) - recognises and names half as one of two equal parts and a quarter as one of four equal parts of an object, shape or quantity (1F1a and 1F1b)	Arithmetical laws and relationships - begins to establish the relationship between addition and subtraction e.g. $2 + 5 = 7$, $7 - 2 = 5$, $2 = 7 - 5$ - realises the effect of adding and subtracting zero Mental fluency - represents and uses number bonds and related subtraction facts within 20 (1C1) - adds and subtracts one-digit and two-digit numbers to 20, including zero (1C2a) Written fluency - reads, writes and interprets mathematical statements involving addition (+), subtraction (–) and equals (=) signs (1C2b) Solving numerical problems - solves one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$ (1C4) - solves one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher (1C8) Fractions, decimals and percentages - finds half and a quarter of an object, shape or quantity – discrete quantities (e.g. <i>cherries on a plate</i>) and continuous quantities (e.g. <i>water</i>) (1F1a and 1F1b) Algebra - recognises and creates repeating patterns with objects and shapes - creates equivalent expressions ($2 + 5 = 5 + 2$)

Measurement	Geometry
Money - recognises and knows the value of different denominations of coins and notes (1M3) Metric measures - measures and begins to record metric measurements (<i>moving on from non-standard units</i>) in a variety of contexts e.g. - length and height - mass/weight - capacity and volume (1M2) - compares and describes measures using appropriate mathematical language e.g. - length and height (long/short, longer/shorter, tall/short, double/half) - mass/weight (heavy/light, heavier than/lighter than) - capacity and volume (full/empty, more than/less than, half, half full, quarter) (1M1) Chronology - measures and begins to record time in hours, minutes and seconds (1M2) - uses appropriate language (e.g. <i>before, after, next, first, today, tomorrow, morning, afternoon and evening</i>) to sequence events in chronological order (1M4b) - uses the language of time relating to dates including days of the week, weeks, months and years (1M4c) - tells the time to the hour and half past the hour and draws hands on a clock face (1M4a) - uses the vocabulary related to time (seconds, minutes, hours and days) Solves problems - solves practical problems in a variety of contexts (1M1)	Properties of shape - recognises and names common 2-D shapes e.g; rectangles (including squares), circles and triangles (1G1a) - in different orientations - in different sizes - recognises and names common 3-D shapes e.g; cuboids (including cubes, pyramids and spheres) (1G1b) - in different orientations - in different sizes Position and direction - describes position, direction and movement, including whole, half and three quarter turns (1P2) - uses language such as <i>left, right, top, middle, bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside</i>
	Statistics
	(In preparation for year 2 criteria) - begins to compare, sort and classify information, including cross curricular links e.g. <i>in science, using one criterion</i> - begins to construct simple pictograms and tables

Not yet secure in any of these skills – refer to ELG or P-levels	Some of these aspects secure (up to 25%) = A0	Many of these aspects secure (25-60% including 25-60% of Number skills) = A1	Most of these aspects secure (60-80% including 60-80% of Number skills) = A2	Almost all of these aspects secure (80-100% including 80-100% of Number skills) = A3
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HfL Assessment Criteria for Phase A Steps 4/5/6 (based on curriculum expectations for Year 2)

Maths – Number

Understanding the number system	Calculating
Fluency focus: Numbers with up to and beyond 3 digits (read and write numbers up to at least 100 in numerals and words) - counts in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward (2N1) - counts in fractions up to 10, starting from any number, using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalents on the number line (e.g. $1\frac{1}{4}$, $1\frac{2}{4}$ (or $1\frac{1}{2}$), $1\frac{3}{4}$, 2) - reads and writes numbers to at least 100 in numerals and in words (2N2a) - compares and orders numbers from 0 up to 100; use <, > and = signs (2N2b) - recognises the place value of each digit in a two-digit number (tens, ones) (2N3) - identifies, represents and estimates numbers using different representations, including the number line (2N4) - uses place value and number facts to solve problems (2N6) - recognises, finds, names and writes fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity (2F1a)	Arithmetical laws and relationships - recognises and uses the inverse relationship between addition and subtraction and uses this to check calculations and missing number problems (2C3) - shows that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot (2C9a) - shows that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot (2C9b) Mental fluency - recalls and uses addition and subtraction facts to 20 fluently, and derives and uses related facts up to 100 <i>such as</i> $3+7=10$, $10-7=3$ and $7=10-3$ to calculate $30+70=100$, $100-70=30$ and $70=100-30$ (2C1) - adds and subtracts numbers, using concrete objects and pictorial representations, mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers (2C1b) - recalls and uses multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers (2C6) <i>e.g. pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition</i> Written fluency - adds and subtracts numbers using concrete objects and pictorial representations, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers (2C2) - calculates mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs (2C7) Fractions, decimals and percentages - finds fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity (2F1a) (both discrete and continuous quantities) - writes simple fractions e.g. $\frac{1}{2}$ of 6 = 3 (2F1b) - recognises the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ (2F2) Solving numerical problems - solves problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods (2C4) - solves problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts (2C8) Algebra recognises patterns within the number system up to and beyond 100

Measurement		Geometry		
Money - recognises and uses symbols for pounds and pence; combining the amounts to make a particular value (2M3a) Metric measures - estimates, chooses and uses standard units in a variety of contexts to the nearest appropriate unit, including - length and height in any direction (m/cm) - mass (g/kg) - temperature (°C) - capacity (litres/ml) (2M2) - uses all measuring apparatus accurately e.g. rulers, thermometers, scales and measuring vessels - compares and orders lengths, mass, volume/capacity and records the results using >, < and = (2M1) Chronology - tells and writes the time on an analogue clock to 5 minutes, including quarter past/to the hour and draw the hands on a clock face to show these times (2M4a) - knows key time related facts including the number of minutes in an hour, number of hours in a day (2M4c) - compares and sequences intervals of time (2M4b) Solves problems - solves simple problems involving - finding different combinations of coins that equal the same amount of money (2M3b) - addition and subtraction of money including giving change (2M9)		Properties of shape - identifies and describes properties of common 2-D shapes including the number of sides/ vertices and recognising symmetry in a vertical line (2G2a) - pupils read and write names for shapes that are appropriate to their word reading and spelling range - identifies and describes properties of common 3-D shapes including the number of edges, vertices and faces (surfaces) (2G2b) - pupils read and write names for shapes that are appropriate to their word reading and spelling range - pupils recognise 3-D images within 2-D representations - identifies 2-D shapes on the surface of 3-D shapes e.g. a circle on a cylinder and a triangle in a pyramid (2G3) - compares and sorts common 2-D (including semi circles, regular polygons) (2G1a) and 3-D shapes (including cones, cylinders, triangular prisms and pyramids) (2G1b) and everyday objects Position and direction - demonstrates ability to order and arrange mathematical objects, including those in different orientations, in patterns and sequences (2P1) - describes position, direction and movement using mathematical vocabulary in a variety of contexts e.g. - movement in a straight line - distinguishing between rotation as a turn and in terms of right angles for quarter, half and three quarter turns (clockwise and anti-clockwise) - giving instructions to other pupils and programming robots using instructions given in right angles (2P2)		
		Statistics - interprets and constructs simple pictograms, tally charts, block graphs and simple tables to compare information (e.g. using many-to-one correspondence with simple ratios 2, 5, 10) (2S1) - communicates findings by asking and answering questions in relation to their data (2S2a) - totalling - by comparing categorical data using more than one criterion (2S2b) - sorting categories by quantity		
Some of these aspects secure (up to 25%) = not yet A4. Refer to A0/1/2/3 sheet	Many of these aspects secure (25-60% including 25-60% of Number skills) = A4	Most of these aspects secure (60-80% including 60-80% of Number skills) = A5	Almost all of these aspects secure (80-100% including 80-100% of Number skills) = A6	All aspects secure, now going 'deeper and broader' = A+

HfL Assessment Criteria for Phase B Steps 1/2/3 (based on curriculum expectations for Year 3)	
Maths – Number	
Understanding the number system	Calculating
Fluency Focus: Numbers with up to at least 3 digits (whole numbers and decimals with up to 1 dp) through a wide variety of models and representations - counts: - from 0 in multiples of 4, 8, 50 and 100 (3N1b) - up and down in tenths; recognising that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 (3F1a) - reads, writes, compares and orders numbers up to 1000 in numerals and words (3N2a) - recognises the place value of each digit in a three-digit number (hundreds, tens, ones) (3N3) - finds 10 or 100 more or less than a given number (3N2b) - identifies, represents and estimates numbers using different representations (3N4) <i>including those related to measure</i> - solves number problems and practical problems within the context of the fluency focus (3N6) - understands unit fractions and non-unit fractions with small denominators: - recognises, finds, writes and uses fractions of a discrete set of objects (3F1b and 3F1c) - recognises and shows, using diagrams, equivalent fractions (3F2) e.g. <i>on a number line</i> and deduces relationships between them such as size and equivalence going beyond the [0,1] interval, including relating to measure - compares and orders unit fractions and fractions with the same denominators (3F3)	Arithmetic laws and relationships - estimates the answer to a calculation and uses inverse operations to check answers (3C3) <i>Uses and understands commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive facts ($30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$)</i> Mental fluency - adds and subtracts numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds (3C1) - recalls and uses multiplication and division facts for the 3, 4 and 8 multiplication tables (3C6) - writes and calculates mathematical statements for multiplication and division using the multiplication tables that children know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (3C7) Written fluency - adds and subtracts numbers with up to three digits, using formal written methods of columnar addition and subtraction (3C2) Fractions, decimals and percentages - adds and subtracts fractions with the same denominator within one whole e.g.: $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ (3F4) Solving problems - Solves problems including: - missing number problems, using number facts, place value, and more complex addition and subtraction (3C4) - missing number problems involving multiplication and division - integer scaling problems e.g. <i>four times as high, eight times as long etc.</i> - correspondence problems in which n objects are connected to m objects e.g. <i>3 hats and 4 coats, how many different outfits; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children</i> (3C8) - fractions (3F10) Algebra (in preparation for Year 6 statements) - begins to generalise using simple algebraic statements e.g. there are 4 chairs for every table, calculate the chairs needed for 8/10/n tables

Measurement		Geometry	
Money - continues to become fluent in recognising the value of coins (2M3a,b) Metric / imperial measures - uses standard metric units of length (m/cm/mm), capacity/volume (l/ml) and mass (kg/g) in a range of contexts to measure (3M2a,b,c), compares (3M1a,b,c), adds and subtracts (3M9b,c,d) <i>includes mixed units and simple equivalence e.g. 5m = 500cm</i> - reads simple scales, e.g. increments of 2, 5 or 10 <i>includes simple scaling by integers when comparing e.g. 5 times as high or twice as long</i> Perimeter, area, volume - measures the perimeter of simple 2D shapes (3M7) - understands perimeter as a measure of length Chronology - estimates, reads, tells and writes the time with increasing accuracy to the nearest minute (3M4) - uses both analogue and digital including using Roman numerals from I to XII 12 & 24 hour clocks using am and pm where necessary - records time - knows and recalls: (3M4e) - the number of seconds in a minute - the number of days in each month, year and leap year - uses vocabulary of time such as o'clock, morning, afternoon, noon, midnight (3M4d) - compares duration of events (3M4f) including in terms of seconds, minutes and hours Solves problems - adds and subtracts amounts of money to give change using £ and p (3M9a) including mixed units - solves problems in practical contexts - calculates the time taken by particular events or tasks - solves problems involving length, mass and capacity/volume (3M9)		Properties of Shape - draws and <i>describes</i> 2D shapes <i>and their properties</i> (3G3a, 3G4a,b) - includes reflective symmetry, regular & irregular - identifies right angles and angles greater than or less than 90° <i>describes acute and obtuse for angles greater or lesser than a right angle</i> e.g. recognises right-angled and equilateral triangles - makes, recognises and describes 3D shapes, <i>and their properties</i>, in different orientations (3G3b) e.g. triangular prism, square based pyramid <i>extends knowledge to symmetrical and non-symmetrical polygons and polyhedral</i> - identifies horizontal and vertical lines (3G2) - identifies pairs of perpendicular and parallel lines (3G2) - connects decimals and rounding when drawing and measuring straight lines in cm in a variety of contexts Position and Direction - recognises that two right angles make a half turn, three make three quarters of a turn and four a complete turn (360°) (3G4a) - continues to consolidate Y2 statements (2P1 and 2P2)	
		Statistics	
		Processing, representing and interpreting data - interprets and presents data using bar charts, pictograms and tables (3S1) - compares data e.g. say how many more...than... and recognise the category that has most/least - uses a key to interpret represented data - understands and uses simple scales in pictograms and bar charts with increasing accuracy e.g. 2, 5, 10 units per cm includes reading between labelled divisions - solves one-step and two-step questions e.g. <i>How many more? How many fewer?</i> (3S2) - uses information presented in scaled bar charts, pictograms and tables in many contexts - responds to questions of a more complex nature e.g. <i>How many children took part in this survey altogether? How would the data differ if we asked the children in Year 6?</i>	
Some of these aspects secure (up to 25%) = not yet B1. Refer to A4/5/6 sheet	Many of these aspects secure (25-60% including 25-60% of Number skills) = B1	Most of these aspects secure (60-80% including 60-80% of Number skills) = B2	Almost all of these aspects secure (80-100% including 80-100% of Number skills) = B3

HfL Assessment Criteria for Phase B Steps 4/5/6 (based on curriculum expectations for Year 4)

Maths – Number

Understanding the number system	Calculating
Fluency focus: Numbers up to and including 4 digits (whole numbers and decimal numbers with up to 2 decimal places) through a wide variety of models and representations - identifies, represents and estimates numbers using different representations (4N4a) - counts fluently forwards and backwards to include: - multiples of 6, 7, 9, 25 and 1000 (4N1) - through zero to include negative numbers (4N5) - in hundredths (4F1) - intervals of 10, 100 and 1000 from a given number - recognises the place value of each digit (4N3a) and uses this when ordering and comparing numbers: - beyond 1000 and when finding 1000 more than a given number (4N2) - with the same number of decimal places up to two decimal places (4F8) - understanding the value of zero as a place holder - rounds any number to the nearest 10, 100 or 1000 (4N4b) and decimals with one decimal place to the nearest whole number (4F7) - recognises that hundredths arise when dividing an object by a hundred and dividing tenths by ten (4F1) - recognises and shows, using diagrams, families of common equivalent fractions (4F2) - reads Roman numerals to 100 (I to C) (4N3b) - solves number problems and practical problems within the context of the fluency focus (4N6)	Arithmetical laws and relationships - understands and applies the commutative, associative and distributive 'rules' when solving calculations e.g. - that $7 \times 8 = (5 \times 8) + (2 \times 8)$ (distributive) $= 7 \times 2 \times 4$ (associative) 'balancing expressions' including those using division, such as $20 + ? = 100 \div 4$ - understands the relationship between non-unit fractions and multiplication and division, to include equivalence and fractions as operators Mental fluency - uses a range of mental strategies for all four operations appropriate to context and within the fluency focus - considers the reasonableness of results by reference to the context or to the size of the numbers using the skills of estimation and checks accuracy e.g. use of the inverse (4C3) - uses mental recall of multiplication facts including all tables up to 12×12 and quickly derives corresponding division facts, e.g. <i>uses their knowledge of tables and place value in calculations with multiples of 100, such as $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$</i> (4C6a) - uses place value, known and derived facts to multiply and divide, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers (4C6b) - recognises and uses factor pairs and commutativity in mental calculations (4C6c) Written fluency - combines knowledge of number facts and rules of arithmetic to solve written calculations within the fluency focus - adds and subtracts numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate (4C2) - estimates and uses inverse operations to check answers to a calculation (4C3) - multiplies two-digit and three-digit numbers by a one-digit number using formal written layout (4C7) Fractions, decimals and percentages - adds and subtracts fractions with the same denominator (4F4) - recognises and writes decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ 4F6a and of any number of tenths or hundredths (4F6b) - calculates fractions of quantities, including non-unit fractions where the answer is a whole number e.g. find $\frac{3}{4}$ of 20 litres - finds the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths (4F9) Solving numerical problems (using a range of mental and written methods across routine and non-routine problems) - solves addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why (4C4) - solves problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects (4C8) - solves problems involving increasingly harder fractions to calculate quantities and fractions to divide quantities, including non-unit fractions where the answer is a whole number (4F10a) and measure and money problems involving fractions and decimals to two decimal places (4F10b) Algebra (in preparation for Year 6 statements) - begins to use simple formulae expressed in words e.g. rules for finding the perimeter of rectilinear shapes - uses and interprets coordinates in the first quadrant

Measurement	Geometry
Money - is fluent in the use of all denominations (2M3a,b) Metric / imperial measures - converts different units of measure e.g. km to m (4M5) <i>builds on their understanding of place value and decimal notation to record metric measures accurately, including money</i> <i>uses multiplication to convert from larger to smaller units</i> <i>uses division to convert from smaller to larger units</i> Perimeter, area, volume - measures and calculates the perimeter of a rectilinear figure including squares in centimetres and metres (4M7a) <i>expresses perimeter algebraically in the same units</i> - finds the area of rectilinear shapes using counting squares (4M7b) <i>understands area as a measure of surface</i> <i>relates area to arrays and multiplication</i> Chronology - reads, writes and converts between analogue (including clock faces using Roman numerals) and digital 12 and 24 hour clocks using am and pm where necessary (4M4a,b) - converts between different units of measure e.g. hours to minutes (4M5) Solves problems - estimates (4M2), compares (4M1) and calculates (4M9) different measures, including money in pounds and pence - converts between hours and minutes; minutes to seconds; years to months and weeks to days (4M4c) - calculates time durations that pass through the hour	Properties of Shape - compares and classifies geometric shapes based on their properties and sizes (4G2a) e.g. <i>quadrilaterals and triangles extending to parallelogram, rhombus and trapezium; isosceles and scalene</i> - identifies acute and obtuse angles; compares and orders angles up to two right angles (180°) by size (4G4) - decides if a polygon is regular or irregular - identifies lines of symmetry in 2-D shapes presented in different orientations (4G2b) - recognises line symmetry in a variety of diagrams including where the line of symmetry does not dissect the original shape e.g. <i>the original shape may be placed at a distance from and parallel to the axis</i> - completes a simple symmetric figure with respect to a specific line of symmetry (4G2c) - becomes familiar with different orientations of lines of symmetry e.g. <i>vertical, horizontal and diagonal axes</i> - uses a variety of media e.g. <i>peg boards, geo-strips and ICT representation</i> Position and Direction - describes positions on a 2-D grid as co-ordinates in the first quadrant (4P3a) <i>draws and describes a pair of axes in one quadrant, with equal scales and integer labels</i> <i>reads, writes and uses pairs of co-ordinates e.g.(2,5)</i> - describes movements between positions as translations of a given unit to the left/right and up/down (4P2) - plots specified points and draws sides to complete a given polygon (4P3b) Statistics Processing, representing and interpreting data - completes, reads and interprets information presented in bar charts (e.g.: finds the difference between two bars showing temperatures, where one is 20°C and the other is 13°C, on a scale labelled in multiples of five) (4S1) - interprets and presents discrete and continuous data using bar charts, and time graphs using a greater range of scales (4S1) - solves comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs (4S2) - relates the graphical representation of data to recording change over time

Some of these aspects secure (up to 25%) = not yet B4. Refer to B1/2/3 sheet

Many of these aspects secure (25-60% including 25-60% of Number skills) = B4

Most of these aspects secure (60-80% including 60-80% of Number skills) = B5

Almost all of these aspects secure (80-100% including 80-100% of Number skills) = B6

All aspects secure, now going 'deeper and broader' = B+

HfL Assessment Criteria for Phase C Steps 1/2/3 (based on curriculum expectations for Year 5)

Maths – Number

Understanding the number system	Calculating
Fluency Focus: Numbers up to 1 million (whole numbers and decimal with up to 3 decimal places) through a wide variety of models and representations Number and place value - understands and applies the knowledge of place value e.g. reads, writes, orders, compares, estimates, multiplies and divides numbers by 10, 100 and 1000 up to 1 000 000 and to 3 decimal places and as fractions (5N2, 5N3a, 5F6a, 5F8) - rounds decimals with two decimal places to the nearest whole number and to one decimal place (5F7) and any whole number up to 1,000,000 to the nearest 10, 100, 1000, 10,000, and 100,000 (5N4) - counts fluently forwards and backwards to include: - powers of 10 from any given number up to 1,000,000 (5N1) - including through zero and interprets negative numbers in context (5N5) - reads Roman numerals to 1000 (M) and recognises years written in Roman numerals (5N3b) - recognises and converts mixed numbers, improper fractions (5F2a) and recognises and uses thousandths and relates to tenths, hundredths and decimal equivalents (5F6b) - compares and orders fractions whose denominators are all multiples of the same number (5F3) - identifies equivalent fractions of a given fraction represented visually (5F2b) - recognises and shows approximate proportions of a whole and use unit and non-unit fractions, decimals and percentages to describe these, e.g. recognises simple equivalence between fractions, decimals and percentages of any number; $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25 (5F11, 5F12) - solves number problems and practical problems within the context of the fluency focus (5N6)	Arithmetical laws and relationships - uses the commutative, associative and distributive 'rules' when solving calculations in the four operations and other mathematical domains e.g. - distributivity can be expressed as $a(b+c) = ab + ac$ - construct equivalence statements ($3 \times 270 = 3 \times 3 \times 9 \times 10 = 9^2 \times 10$) - finding the volume of a cuboid - recognises, describes using correct vocabulary, and uses number patterns and relationships to establish e.g. - multiples, all factor pairs for a given number and common factors for two numbers (5C5a) - prime factors and composite (non-prime) numbers to 100 (recall primes to 19) (5C5b, 5C5c) - square and cube numbers (and uses notation and recall all square numbers to 144) (5C5d) Mental fluency - justifies solutions and determines in the context of the problem levels of accuracy using estimation, rounding and use of inverse operation (5C3) - uses a range of mental methods of addition and subtraction within the fluency focus e.g. decimal complements to 1 (5C1) - multiplies and divides numbers mentally using known facts 5C6a and uses derived facts e.g. $2.3 \times 4 = 9.2$ - multiplies and divides whole numbers and those involving decimals by 10, 100 and 1000 (5C6b) Written fluency - uses formal written columnar methods of addition and subtraction (5C2) within the fluency focus and reasons why they are appropriate - multiplies numbers with up to four digits by a one or two digit number using a formal written method, including long multiplication for two digit numbers (5C7a) - divides numbers with up to four digits by a one digit number using the formal written method of short division and interprets remainders appropriately for the context (5C7b) Fractions, decimals and percentages - adds and subtracts fractions whose denominators are multiples of the same number (5F4) - multiplies proper fractions and mixed numbers by whole numbers supported by materials and diagrams (5F5) Solving numerical problems (using a range of mental and written methods across routine and non-routine problems) - solves numerical problems within the fluency focus and through a range of contexts including understanding the meaning of the = sign (5C8b) e.g. - addition and subtraction multi-step problems in contexts deciding which operation to use and why (5C4) - using knowledge of factors, multiples, squares and cubes (5C8a) - scaling by simple fractions and problems involving simple rates (5C8c) - multiplying and dividing by powers of 10 in scale drawings - using all four operations to balance equations ($33 = 5 \times a$) Algebra - begins to write equations to express situations - locates points and solves problems in the first quadrant

Measurement		Geometry	
Metric / imperial measures - converts between different units of metric units of measure for length, capacity and mass, e.g. <i>1.2 kg = 1200 g; how many 200 ml cups can be filled from a 2 litre bottle?; write 605cm in metres</i> (5M5) - understands and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints (5M6) Perimeter, Area, Volume - measures and calculates the perimeter of composite rectilinear shapes in centimetres and metres (5M7a) <i>calculates the perimeter of rectangles and related composite shapes including using the relations of perimeter or area to find unknown lengths</i> <i>missing measure questions can be expressed algebraically e.g. $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20 cm</i> - calculates and compares the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes (5M7b) - estimates volume, e.g.: <i>using 1cm³ blocks to build cuboids (including cubes) and capacity (e.g. using water)</i> (5M8) Chronology - calculates the duration of an event using appropriate units of time, e.g. <i>'a film starts at 6:45pm and finishes at 8:05pm. How long did it last?'</i> (5M4) - calculates time durations that bridge the hour - reads and interprets timetables (5S1) Solve problems - solves problems involving converting between units of time (5M4) - uses all four operations to solve problems involving measure (a: money; b: length; c: mass / weight; d: capacity / volume) using decimal notation, including scaling (5M9)		Properties of shape - uses the properties of rectangles to deduce related facts and find missing lengths and angles (5G2a) - distinguishes between regular and irregular polygons based on reasoning about equal sides and angles (5G2b) <i>uses conventional markings for parallel lines and right angles</i> - identifies 3D shapes including cubes and other cuboids, from 2D representations (5G3b) - knows angles are measured in degrees: estimate and compare acute, obtuse and reflex angles (5G4a) - identifies: - angles at a point and one whole turn (total 360°) - angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90° (5G4b) - draws given angles and measure them in degrees(°) (5G4c) - uses the term diagonal and makes conjectures about the angles formed between sides, and between diagonals and parallel sides and other properties of quadrilaterals Position and direction - identifies, describes and represents the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed (5P2) - translates shapes horizontally or vertically - uses a grid and co-ordinates in the first quadrant to plot the reflection in a mirror line presented in lines that are parallel to the axes - begins to use the distance of vertices from the mirror line to reflect shapes more accurately	
Statistics			
Processing, representing and interpreting data - completes, reads and interprets information in tables, including timetables (5S1) - solves comparison, sum and difference problems using information presented in a line graph (5S2) - collects, represents and interprets continuous data - decides upon an appropriate scale for a graph, e.g. labelled divisions representing 2, 5, 10, 100 - reads between the labelled divisions, e.g. reads 17 on a scale labelled in fives			
Some of these aspects secure (up to 25%) = not yet C1. Refer to B4/5/6 sheet	Many of these aspects secure (25-60% including 25-60% of Number skills) = C1	Most of these aspects secure (60-80% including 60-80% of Number skills) = C2	Almost all of these aspects secure (80-100% including 80-100% of Number skills) = C3

HfL Assessment Criteria for Phase C Steps 4/5/6 (based on curriculum expectations for Year 6)	
Maths – Number	
Understanding the number system	Calculating
Fluency Focus Numbers up to 10 million (whole numbers, negative numbers and decimals with up to 3 decimal places) through a wide variety of models and representations Number and place value - reads, writes, orders and compares numbers within the fluency focus: - uses this knowledge to develop their skills of rounding to any degree of accuracy, estimating, predicting and checking the reasonableness of answers (6N2, 6N4) - identifies the value of each digit in numbers to 10 000 000 and numbers with up to 3 decimal places and multiplies and divides by 10, 100 and 1000, giving answers to three decimal places (6N3, 6F9a) - compares and orders fractions, including fractions >1 (6F3) - recognises, describes and uses number patterns and relationships to make generalisations about sequences within the whole number system - uses negative numbers in context, and calculates intervals across zero (6N5) - uses common multiples to express fractions in the same denomination (6F2) - recalls and uses equivalences between simple fractions, decimals and percentages including in different contexts (6F11) - solves number problems and practical problems within the context of the fluency focus (6N6)	Arithmetical laws and relationships - uses their knowledge of the order of operations to carry out calculations involving the four operations e.g. $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$ (6C9) Mental fluency - uses estimation to check answers to calculations and determines in the context of a problem, an appropriate degree of accuracy (6C3) - identifies common factors, common multiples and prime numbers (6C5) - performs mental calculations, including with mixed operations and large numbers (6C6) - continues to use all known facts to calculate mathematical statements with increasing complexity Written fluency - solves addition and subtraction problems within the fluency focus and gives reasons why operations and methods are appropriate (6C4) - multiplies multi-digit numbers up to four digits by a two digit number using the formal written method of long multiplication (6C7a) and divides numbers up to four digits by a two digit number using the formal written methods of long and short division and interprets remainders as whole numbers, fractions, or by rounding, as appropriate for the context (6C7b, 6C7c) Fractions, decimals and percentages - uses common factors to simplify fractions (6F2) - adds and subtracts fractions with different denominators and mixed numbers, using the concept of equivalent fractions (6F4) - multiplies simple pairs of proper fractions, writing the answer in its simplest form [e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] (6F5a) - divides proper fractions by whole numbers e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$ (6F5b) - associates a fraction with division and calculates decimal fraction equivalents for a simple fraction e.g. $3 \div 5 = 0.6 = \frac{3}{5}$ (6F6) - multiplies one-digit numbers with up to two decimal places by whole numbers (6F9b) - uses written division methods in cases where the answer has two decimal places (6F9c) Ratio and proportion Solves problems involving: - relative sizes of two quantities where missing values can be found by using integer multiplication and division (6R1) - calculation of percentages and the use of percentages for comparison (percentages of 360° to calculate angles on a pie chart) (6R2) - similar shapes where the scale factor is known or can be found (6R3) - unequal quantities (e.g. for every egg you need three spoonful of flour) (6R4) Algebra - uses simple formulae to generate, express and describe: (6A1, 6A2, 6A3) - linear number sequences - mathematical formula - missing number, lengths, coordinates and angles problems - equivalent expressions ($a + b = b + a$) - finds pairs of numbers that satisfy an equation with two unknowns (6A4) - finds all possibilities of combinations of two variables (6A5) Solving numerical problems (using a range of mental and written methods across routine and non-routine problems) - solves increasingly complex numerical problems (including multistep) within the fluency focus and through a range of contexts using estimation to check answers and an appropriate degree of accuracy (6C3, 6C8) - solves problems which require answers to be rounded to specified degrees of accuracy (6F10)

Measurement		Geometry		
Metric / imperial measures - uses, reads, writes and converts between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation of up to three decimal places (6M5) - converts between miles and kilometres (6M6) <i>connects conversion from kilometres to miles in measurement to its graphical representation</i> Perimeter, Area, Volume - recognises that shapes with the same areas can have different perimeters and vice versa (6M7a) - calculates the area of parallelograms and triangles (6M7b) - recognises when it is possible to use the formulae for the area of shapes (6M7c) - calculates, estimates and compares volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units <i>e.g. mm³ and km³</i> (6M8a) - recognises when it is possible to use the formulae for the volume of shapes (6M8b) Solve problems - solves problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (6M9)		Properties of shape - compares and classifies geometric shapes based on their properties and sizes (6G2a) - describes simple 3D shapes (6G2b) - draws 2D shapes using given dimensions and angles (6G3a) - recognises and builds simple 3D shapes including making nets (6G3b) - visualises a 3D shape from its net and matches vertices that will be joined - visualises where patterns drawn on a 3D shape will occur on its net - finds unknown angles in any triangles, quadrilaterals and regular polygons (6G4a) - recognises angles where they meet at a point, are on a straight line, or are vertically opposite, and finds missing angles (6G4b) <i>explains how unknown angles and lengths can be derived from known measurements</i> <i>relationships might be expressed algebraically e.g. $d = 2 \times r$; $a = 180 - (b + c)$</i> - illustrates and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius (6G5) Position and direction - draws and translates simple shapes on the coordinate plane, and reflects them in the axis (6P2) <i>predicts missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to (a-2, b+3); (a, b) and (a+d, b+d) being opposite vertices of a square of side d</i> - describes positions on the full coordinate grid (all four quadrants) (6P3)		
Statistics				
Processing, representing and interpreting data - interprets and constructs pie charts and line graphs and uses these to solve problems (6S1) <i>connects work on angles, fractions and percentages to the interpretation of pie charts</i> - recognises the difference between discrete and continuous data - recognises when information is presented in a misleading way, e.g. compares two pie charts where the sample sizes are different - when drawing conclusions, identifies further questions to ask <i>begins to decide which representation of data is most appropriate and why</i> - calculates and interprets the mean as an average (6S3) <i>knows when it is appropriate to find the mean median and mode of a data set</i>				
Some of these aspects secure (up to 25%) = not yet C4. Refer to C1/2/3 sheet	Many of these aspects secure (25-60% including 25-60% of Number skills) = C4	Most of these aspects secure (60-80% including 60-80% of Number skills) = C5	Almost all of these aspects secure (80-100% including 80-100% of Number skills) = C6	All aspects secure, now going ‘deeper and broader’, solving more complex problems etc = C+