Year 5 Learning and Progression Steps for Mathematics

What are Learning and Progression Steps (LAPS)?

The Learning and Progression Steps are designed to scaffold the learning required in order to meet the expectations of the National Curriculum. Statements in the Lancashire Key Learning for Mathematics document have been broken down into smaller steps to support teachers in planning appropriate learning opportunities. These key pieces of learning will support pupils in becoming fluent in the knowledge and skills of the curriculum and ensure that the learning is effective and sustained.

The number of steps is dependent on the learning and do **not** constitute expectations for the end of each term.

The final step in the progression for each strand of learning is the end of year expectation.

The steps are **not** of equal size and different amounts of time may be required for children to move between individual steps. For example,

Understand how multiplication and division statements can be represented using arrays	Use arrays to identify what the term 'factor' means	Use arrays to identify all the factor pairs of a given number	Identify factor pairs of a given number within the multiplication tables that they know

Progression is likely to be within the same lesson

Progression is likely to be over a series of lessons

Some learning within the same end of year expectation has been split and designed to run concurrently alongside each other. For example,

Read and write numbers up to 1000 in numerals and in words	Read multiples of 1000 to 10 000 in numerals and in words	Read multiples of 100 to 10 000 in numerals and in words	Read numbers to 10 000 where 0 is not used as a place holder	Read numbers to 10 000 where 0 is used as a place holder	***Read and write numbers to at least 10 000***
	Write multiples of 1000 to 10 000 in numerals and in words	Write multiples of 100 to 10 000 in numerals and in words	Write numbers to 10 000 where 0 is not used as a place holder	Write numbers to 10 000 where 0 is used as a place holder	

Some LAPS may need to be completed before another can be started.

Where have they come from?

The Learning and Progression Steps (LAPS) have been derived from the Lancashire Key Learning in Mathematics statements, identified primarily from the National Curriculum 2014 programmes of study.

How are they different from the Key Learning Statements?

The Learning and Progression Steps (LAPS) are smaller, progressive steps which support learning towards the Key Learning in Mathematics expectations.

How are they different from the Key Learning Indicators of Performance (KLIPs)?

The Key Learning Indicators of Performance (KLIPs) document is an assessment tool. The Learning and Progression Steps (LAPS) document is a planning tool and is not intended to be used for summative assessment purposes. However, they may support teachers in judging whether children are on track to meet the end of year expectations at different points throughout the year.

The terms 'entering', 'developing' and 'secure' are used in Lancashire's assessment approach, KLIPs, as summative judgements in relation to age related expectations. Definitions for these terms can be found in the introduction to the KLIPs document.

How might Learning and Progression Steps (LAPS) in Mathematics be useful?

Learning and Progression Steps (LAPS) may be used in a number of ways. For whole class teaching, LAPS may be used to support differentiation. When planning, it may be appropriate to use LAPS statements to inform learning objectives for a session or number of sessions. Learning and Progression Steps (LAPS) in Mathematics should be selected according to the learning needs of the individual or group. Emphasis however, should always be on developing breadth and depth of learning to ensure skills, knowledge and understanding are sufficiently embedded before moving on.
The LAPS should **not** be used as an assessment tool, but they can inform teachers about children's progress towards the end of year expectations at the end of each term.

Are LAPS consistent with the other resources from the Lancashire Mathematics Team?

Yes, the LAPS are related to the content of the Mathematics Planning Support Disc and also the Progression Towards Written Calculation Policies and the Progression in Mental Calculation Strategies.
These can be found on the website:
www.lancsngfl.ac.uk/curriculum/primarymaths

These Learning and Progression Statements (LAPS) are designed to show the necessary steps in learning to make effective and sustainable progress within a single year. They begin with the 'end of year' expectation from the previous year and build up to the 'end of year expectation' of the current year.

The number of steps is dependent on the learning and do **not** constitute expectations for the end of each term.

The steps are **not** of equal size and different amounts of time may be required for children to move between individual steps.

<table>
<tr><td rowspan="13">Number and Place Value</td><td>End of Year 4 expectation</td><td colspan="5">Learning and Progression Statements</td><td>End of Year 5 expectation</td></tr>
<tr><td>Count in multiples of 6, 7, 9, 25 and 1000
Count backwards through zero to include negative numbers</td><td>Count forwards and backwards in steps of 10, 100 or 1000 (Year 4 steps) for any given number up to 100 000 (Year 5 number)</td><td>Count forwards and backwards in steps of 10, 100 or 1000 (Year 4 steps) for any given number up to 1 000 000 (Year 5 number)</td><td>Count forwards and backwards in steps of 10 000 without crossing 100 000 boundaries for any given number up to 1 000 000</td><td>Count forwards and backwards in steps of 10 000 crossing 100 000 boundaries for any given number up to 1 000 000</td><td>Count forwards and backwards in steps of 100 000 for any given number up to 1 000 000</td><td>Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</td></tr>
<tr><td>Count up and down in hundredths</td><td colspan="2">Count forwards and backwards in decimal steps where the step size is in multiples of tenths,
e.g. 1.4, 1.7, 2.0, 2.3, 2.6
(step size 0.3)</td><td colspan="2">Count forwards and backwards in decimal steps where the step size is in multiples of hundredths less than a tenth,
e.g. 2.31, 2.37, 2.43, 2.49
(step size 0.06)</td><td colspan="2">Count forwards and backwards in decimal steps where the step size is in multiples of hundredths greater than a tenth,
e.g. 2.42, 2.57, 2.72, 2.87
(step size 0.15)</td><td>Count forwards and backwards in decimal steps where the step size is in thousandths,
e.g. 5.742, 5.747, 5.752, 5.757
(step size 0.005)</td><td>Count forwards and backwards in decimal steps</td></tr>
<tr><td rowspan="4">Read and write numbers to at least 10 000
Recognise the place value of each digit in a four-digit number</td><td colspan="2">Read numbers to 1 000 000 where 0 is not used as a place holder</td><td colspan="2">Read numbers to 1 000 000 where 0 is used as a place holder in any position</td><td colspan="2">Read any seven digit number</td><td rowspan="4">Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</td></tr>
<tr><td colspan="2">Write numbers to 1 000 000 where 0 is not used as a place holder</td><td colspan="2">Write numbers to 1 000 000 where 0 is used as a place holder in any position</td><td colspan="2">Write any seven digit number</td></tr>
<tr><td colspan="2">Order numbers to 1 000 000 where 0 is not used as a place holder</td><td colspan="2">Order numbers to 1 000 000 where 0 is used as a place holder in any position</td><td colspan="2">Order numbers with up to seven digits</td></tr>
<tr><td colspan="2">Compare numbers to 1 000 000 where 0 is not used as a place holder</td><td colspan="2">Compare numbers to 1 000 000 where 0 is used as a place holder in any position</td><td colspan="2">Compare numbers with up to seven digits</td></tr>
<tr><td rowspan="4">Read and write numbers with up to two decimal places
Order and compare numbers beyond 1000</td><td colspan="3">Read numbers up to three decimal places where 0 is not used as a place holder</td><td colspan="3">Read numbers up to three decimal places where 0 is used as a place holder in any position</td><td rowspan="4">Read, write, order and compare numbers with up to 3 decimal places</td></tr>
<tr><td colspan="3">Write numbers up to three decimal places where 0 is not used as a place holder</td><td colspan="3">Write numbers up to three decimal places where 0 is used as a place holder in any position</td></tr>
<tr><td colspan="3">Order numbers up to three decimal places where 0 is not used as a place holder</td><td colspan="3">Order numbers up to three decimal places where 0 is used as a place holder in any position</td></tr>
<tr><td colspan="3">Compare numbers up to three decimal places where 0 is not used as a place holder</td><td colspan="3">Compare numbers up to three decimal places where 0 is used as a place holder in any position</td></tr>
</table>

	Identify the value of each digit to two decimal places	Use a place value chart to support with identifying the value of each digit to three decimal places, e.g. the value of the digit 5 in 4.725 is five thousandths, $\frac{5}{1000}$ or 0.005			Identify the value of each digit to three decimal places in a variety of ways, e.g. the value of the digit 7 in 3.867 is seven thousandths, $\frac{7}{1000}$ or 0.007			***Identify the value of each digit to three decimal places***
	Identify, represent and estimate numbers using different representations *(including the number line)*	Identify, represent and estimate numbers on a numberline from 0 to 100 000 where the number line has ten demarcations	Identify, represent and estimate numbers on a numberline from 0 to 1 000 000 where the number line has ten demarcations	Identify, represent and estimate numbers on a numberline from 0 to 100 000 where the number line has no demarcations	Identify, represent and estimate numbers on a numberline from 0 to 1 000 000 where the number line has no demarcations	Identify, represent and estimate numbers up to 100 000 on a number line where the starting point is a number other than 0 (e.g. 50 000 to 75 000)	Identify, represent and estimate numbers up to 1 000 000 on a number line where the starting point is a number other than 0 (e.g. 600 000 to 950 000)	***Identify, represent and estimate numbers using the number line***
	Find *0.1, 1, 10, 100 or* 1000 more or less than a given number	Find 0.01, 0.1, 1, 10, 100, 1000 more or less than a given number up to 1 000 000 without crossing boundaries	Find 10 000 more or less than a given number up to 1 000 000 without crossing 100 000 boundaries	Find 100 000 more or less than a given number up to 1 000 000	Find 0.01, 0.1, 1, 10, 100, 1000 more or less than a given number up to 1 000 000 including where boundaries will be crossed	Find 10 000 more or less than a given number up to 1 000 000 crossing 100 000 boundaries		***Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number***
	Round any number to the nearest 10, 100 or 1000	Round any number up to 100 000 (Year 5 number) to the nearest 10, 100 or 1000 (Year 4 rounding)	Round any number up to 1 000 000 (Year 5 number) to the nearest 10, 100 or 1000 (Year 4 rounding)	Round any number up to 100 000 to the nearest 10 000	Round any number up to 1 000 000 to the nearest 10 000	Round any number up to 1 000 000 to the nearest 100 000		***Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000***
	Round decimals (one decimal place) to the nearest whole number	Round decimals with two decimal places to the nearest whole number (e.g. 267.62 rounds to 268)			Round decimals with two decimal places to one decimal place (e.g. 1324.49 rounds to 1324.5)			**Round decimals with two decimal places to the nearest whole number and to one decimal place**
	Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer	Multiply/divide whole numbers and decimals by 10 where 0 is not used as a place holder, e.g. 3.24 x 10 or 729 ÷ 10	Multiply/divide whole numbers and decimals by 10 where 0 is used as a place holder, e.g. 2. 04 x 10 or 806 ÷ 10	Multiply/divide whole numbers and decimals by 100 where 0 is not used as a place holder, e.g. 5.68 x 100 or 8532 ÷ 100	Multiply/divide whole numbers and decimals by 100 where 0 is used as a place holder, e.g. 15.106 x 100 or 4070 ÷ 100	Multiply/divide whole numbers and decimals by 1000 where 0 is not used as a place holder, e.g. 19.73 x 1000 or 2378 ÷ 1000	Multiply/divide whole numbers and decimals by 1000 where 0 is used as a place holder, e.g. 33.003 x 1000 or 123 006 ÷ 1000	**Multiply/divide whole numbers and decimals by 10, 100 and 1000**
	***Order and* compare numbers with the same number of decimal places up to two decimal places**	Explain the meaning of a negative number in a variety of real life contexts (e.g. below freezing, below sea level, under par (golf), negative goal difference)			Count on and back with positive and negative whole numbers through zero			**Interpret negative numbers in context, count on and back with positive and negative whole numbers, including through zero**

	Describe and extend number sequences involving counting on or back in different steps, including sequences with multiplication and division steps	Describe and extend number sequences where the step size is in multiples of tenths, e.g. 1.4, 1.7, 2.0, 2.3 (step size 0.3)	Describe and extend number sequences where the step size is in multiples of hundredths less than a tenth, e.g. 2.31, 2.37, 2.43, 2.49 (step size 0.06)	Describe and extend number sequences where the step size is in multiples of hundredths greater than a tenth, e.g. 2.42, 2.57, 2.72, 2.87 (step size 0.15)	Describe and extend number sequences where the step size is in thousandths, e.g. 5.742, 5.747, 5.752 (step size 0.005)	Describe and extend number sequences with multiplication and division steps (e.g. 13, 26, 52, 104 or 14 500, 1450, 145, 14.5, 1.45, 0.145)	***Describe and extend number sequences including those with multiplication/division steps and where the step size is a decimal***
	Read Roman numerals to 100 and know that over time, the numeral system changed to include the concept of zero and place value	Read Roman numerals using the symbols I, V, X, L, C, D, M where subtracting of the symbols (e.g. a lower value symbol in front of a higher value one such as IX, CM) is not required			Read Roman numerals using the symbols I, V, X, L, C, D, M in any order		**Read Roman numerals to 1000 (M); recognise years written as such**
	Solve number and practical problems that involve all of the above and with increasingly large positive numbers	Children need frequent access to arrange of contexts using the content from all of the above. See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc					**Solve number and practical problems that involve all of the above**

Number – Addition and Subtraction	End of Year 4 expectation	Learning and Progression Statements					End of Year 5 expectation
	Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)	**Children need frequent opportunities to select appropriate strategies from the range they have learnt. The most efficient strategy may differ between children as it will be based on their confidence and competence.**					***Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)***
	These steps fit the Lancashire Progression Towards Written Calculation Policies and Progression in Mental Calculations Policies						
	Select a mental strategy appropriate for the numbers involved in the calculation	Recognise and solve calculations that involve known or related facts e.g. 1.2 + 0.8	Recognise that the numbers in addition calculations can be reordered to make calculating more efficient e.g. 1.7 + 2.8 + 0.3 becomes 1.7 + 0.3 + 2.8 or 58 + 47 – 38 becomes 58 – 38 + 47 and use this strategy where appropriate	Recognise calculations that require mental partitioning e.g. 4300 + 1400 or 424 - 250 and use this strategy where appropriate *(This could be supported by jottings)*	Recognise calculations that require counting on mentally to find the difference e.g. 5003 - 1960 (counting efficiently between the two numbers) and use this strategy where appropriate *(This could be supported by a number line)*	Recognise calculations that require counting on or back mentally, bridging through a multiple of 10 efficiently e.g. 1995 + 278 becomes 1995 + 5 + 273 or 703 – 128 becomes 703 – 3 – 125 and use this strategy where appropriate *(This could be supported by pictures or jottings)* Recognise calculations that require a mental compensation method e.g. 325 + 298 becomes 325 + 300 – 2 and use this strategy where appropriate *(This could be supported by pictures or jottings)*	***Select a mental strategy appropriate for the numbers involved in the calculation***
	Recall and use addition and subtraction facts for 100 Recall and use +/- facts for multiples of 100 totalling 1000	Recall and use addition and subtraction facts for 1 (with decimal numbers to one decimal place)			Recall and use addition and subtraction facts for 10 (with decimal numbers to one decimal place)		***Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)***
	Derive and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)	Use practical apparatus (e.g. place value counters, a 10 by 10 grid, a 100 bead string) and known facts (e.g. 42 + 58 = 100) to create addition and subtraction facts for 1 with decimal numbers to two decimal places (e.g. 0.42 + 0.58 = 1)		Create generalisations based on addition and subtraction facts for 1 (e.g. the hundredths digits sum to 0.1 and the tenths digits sum to 0.9 and these add to give a total of 1)		Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)	***Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)***

<table>
<tr><td rowspan="5"></td><td rowspan="2">Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place</td><td colspan="2">Add and subtract a four-digit number to/from another four-digit number where no boundaries are crossed
e.g. 5124 + 1352</td><td colspan="2">Add and subtract increasingly large numbers using appropriate mental strategies
e.g. 147 654 – 147 632 or 2854 + 1400</td><td rowspan="2">Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places</td></tr>
<tr><td>Add and subtract a number with two decimal places to/from a whole number, e.g. 4.32 + 4</td><td>Add and subtract a number with two decimal places to/from another where the tenths boundary is not crossed, e.g. 5.45 – 2.33</td><td>Add a number with up to two decimal places to another where the tenths <u>or</u> ones boundary is crossed,
e.g. 14.68 + 3.24 or 6.32 – 3.5
(This could be supported by jottings or a number line)</td></tr>
<tr><td rowspan="2">Add and subtract numbers with up to 4 digits and decimals with one decimal place using the formal written methods of columnar addition and subtraction where appropriate</td><td>Add whole numbers with more than 4 digits including combinations of numbers with different amounts of digits
e.g. 4689 + 67 302 + 785 =</td><td>Add decimals with two decimal places,
e.g. 53.67 + 26.54 =</td><td>Add decimals with up to two decimal places,
e.g. 154.7 + 68.56 =</td><td rowspan="2">Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction)</td></tr>
<tr><td>Subtract whole numbers with more than 4 digits including pairs of numbers with different amounts of digits, e.g. 54 368 - 9279</td><td>Subtract decimals with two decimal places,
e.g. 206.04 – 72.36</td><td>Subtract decimals with up to two decimal places including pairs of numbers with different amounts of digits, e.g. 245.3 – 72.64</td></tr>
<tr><td>Estimate; use inverse operations to check answers to a calculation</td><td colspan="3">Round numbers to an appropriate power of 10
e.g. 45 267 + 8214 + 210 becomes
45 300 + 8000 + 200</td><td>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</td></tr>
<tr><td>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</td><td colspan="3">Children need frequent access to arrange of contexts using the content from all of the above.
See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc</td><td>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</td></tr>
<tr><td>Solve addition and subtraction problems involving missing numbers</td><td colspan="3">Children need frequent access to arrange of contexts using the content from all of the above.
See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc</td><td>Solve addition and subtraction problems involving missing numbers</td></tr>
</table>

Number – Multiplication and Division	End of Year 4 expectation	Learning and Progression Statements						End of Year 5 expectation
	Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)	**Children need frequent opportunities to select appropriate strategies from the range they have learnt. The most efficient strategy may differ between children as it will be based on their confidence and competence.**						***Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)***
	Recognise and use factor pairs and commutativity in mental calculations	Identify multiples of 2, 3, 4, 5, 6, 9, 10, 20, 25, 50 and 100 using rules of divisibility			Identify multiples of 7 and 8 using rules of divisibility			**Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers**
		Use and derive multiplication and division facts to identify factors within known tables	Use a list strategy to identify common factors of two numbers within known tables	Use known facts to derive factors of multiples of 10 and 100, e.g. 240 could be factorised to 6 x 40	Identify factors of numbers beyond known tables (e.g. 91)	Use a list strategy to identify common factors of two numbers beyond known tables	Use factors to construct equivalence statements, e.g. 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 9^2 x 10	
	Recall multiplication and division facts for multiplication tables up to 12 × 12	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers						**Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers**
	Recall multiplication and division facts for multiplication tables up to 12 × 12	Establish whether a number up to 100 is prime			Recall prime numbers up to 19			**Establish whether a number up to 100 is prime and recall prime numbers up to 19**
	No equivalent in Y4	Recognise that a square number is the product of two equal integers and can be written using ^{2} notation, e.g. 7x7 = 7^2	Recognise and use square numbers up to 12^2		Recognise that a cube number is the product of three equal integers and can be written using ^{3} notation, e.g. 4x4x4 = 4^3	Recognise and use cube numbers for 1^3, 2^3, 3^3, 4^3, 5^3 and 10^3		**Recognise and use square (^{2}) and cube (^{3}) numbers, and notation**
	Use partitioning to double or halve any number, including decimals to one decimal place	Use partitioning to double any decimal number to two decimal places						***Use partitioning to double or halve any number, including decimals to two decimal places***
		Use partitioning to halve any decimal number to two decimal places where all the digits are even, e.g. halve 4.68			Use partitioning to halve any decimal number to two decimal places where not all the digits are even, e.g. halve 6.74			

	Use place value, known and derived facts to multiply and divide mentally, including: **- multiplying by 0 and 1** **- dividing by 1** **- multiplying together three numbers**	Multiply a two-digit number by a one-digit number using a partitioning strategy	Use knowledge of place value and multiplication facts to multiply multiples of 100 and 1000 by a one-digit number e.g. 3000 x 8 = 24 000	Use knowledge of place value and multiplication facts to decimals by a one-digit number e.g. 0.7 x 6 = 4.2	Multiply a U.t number by a one-digit number using a partitioning strategy	**Multiply and divide numbers mentally drawing upon known facts**
		Use knowledge of place value and multiplication facts to divide related larger numbers e.g. 6300 ÷ 9 = 700	Divide a three-digit number by a one-digit number using a partitioning strategy e.g. 942 ÷ 6 becomes (600 ÷ 6) + (300 ÷ 6) + (42 ÷ 6)	Use knowledge of place value and multiplication facts to divide related decimal numbers where the dividend is scaled down e.g. 3.2 ÷ 8 = 0.4	Use knowledge of place value and multiplication facts to divide related decimal numbers where the dividend and divisor are scaled down e.g. 3.2 ÷ 0.8 = 4	
	No equivalent objective in Y4	Children need frequent access to arrange of contexts using the content from all of the above. See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc				**Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes**
	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Multiply a 4 digit by a 1 digit number using a formal written method	Multiply a 2 digit by a 2 digit number using a formal written method	Multiply a 3 digit by a 2 digit number using a formal written method	Multiply a 4 digit by a 2 digit number using a formal written method	**Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers**
	Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	Divide a 4 digit number by a 1 digit number		Divide a 4 digit number by a 1 digit number and interpret remainders appropriately for the context		**Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context**
	Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	There are no steps towards this end of year objective				***Use estimation/inverse to check answers to calculations; determine, in the context of a problem, an appropriate degree of accuracy***

	Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, *division (including interpreting remainders),* integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Children need frequent access to arrange of contexts using the content from all of the above. See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc.	**Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign**
	Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, *division (including interpreting remainders),* integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Children need frequent access to arrange of contexts using the content from all of the above. See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc	**Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates**

Number – Fractions	End of Year 4 expectation	Learning and Progression Statements						End of Year 5 expectation
	No equivalent objective in Y4	Recognise a mixed number with a fractional part in halves, thirds or quarters and convert it to an improper fraction and vice-versa			Recognise a mixed number and convert it to an improper fraction and vice-versa			**Recognise mixed numbers and improper fractions and convert from one form to the other**
	No equivalent objective in Y4	Read and write decimal numbers as fractions in tenths or hundredths, e.g. 0.9 = $\frac{9}{10}$, 0.71 = $\frac{71}{100}$			Read and write decimal numbers as fractions, e.g. 0.8 = $\frac{8}{10}$ = $\frac{4}{5}$, 0.85 = $\frac{85}{100}$ = $\frac{17}{20}$			**Read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100}$)**
	Count on and back in steps of unit fractions	Count on in mixed number steps where the fractional part is a unit fraction in halves, thirds or quarters	Count back in mixed number steps where the fractional part is a unit fraction in halves, thirds or quarters	Count on in mixed number steps where the fractional part is a non-unit fraction in thirds or quarters	Count back in mixed number steps where the fractional part is a non-unit fraction in thirds or quarters	Count on in mixed number steps	Count back in mixed number steps	***Count on and back in mixed number steps such as $1\frac{1}{2}$***
	Compare and order unit fractions and fractions with the same denominators (including on a number line)	Compare and order two fractions where the denominator of one fraction is a multiple of the denominator of the other fraction, e.g. compare $\frac{2}{3}$ and $\frac{7}{9}$		Compare and order two fractions whose denominators are both multiples of the same number, e.g. compare $\frac{24}{32}$ and $\frac{32}{56}$ (only where the numerator allows a conversion to the common denominator)		Compare and order more than two fractions whose denominators are all multiples of the same number (only where the numerator allows a conversion to the common denominator)		**Compare and order fractions whose denominators are all multiples of the same number *(including on a number line)***
	Recognise and show, using diagrams, families of common equivalent fractions	Identify, name and write equivalent fractions of a given fraction by using multiplication and division facts, e.g. $\frac{5}{7}$ = $\frac{40}{56}$			Identify, name and write equivalent fractions for tenths and hundredths, e.g. $\frac{85}{100}$ = $\frac{17}{20}$			**Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths**
	Recognise and write decimal equivalents of any number of tenths or hundredths **Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$**	Recognise and use thousandths, e.g. $\frac{3}{1000}$ = 0.003 and vice-versa			Relate thousandths to tenths and hundredths, e.g. $\frac{70}{1000}$ = $\frac{7}{100}$ = 0.07, $\frac{900}{1000}$ = $\frac{9}{10}$ = 0.9			**Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents**

<table>
<tr><td rowspan="5"></td><td>Add and subtract fractions with the same denominator (using diagrams)</td><td colspan="2">Add fractions with denominators that are multiples of the same number where the answer is less than 1, e.g. $\frac{2}{3}+\frac{1}{6}=\frac{4}{6}+\frac{1}{6}=\frac{5}{6}$</td><td colspan="2">Add fractions with denominators that are multiples of the same number where the answer is greater than 1,
e.g. $\frac{2}{5}+\frac{9}{10}=\frac{4}{10}+\frac{9}{10}=\frac{13}{10}=1\frac{3}{10}$;
$1\frac{1}{4}+3\frac{7}{8}=1\frac{2}{8}+3\frac{7}{8}=5\frac{1}{8}$</td><td rowspan="2">Add and subtract fractions with denominators that are the same and that are multiples of the same number (using diagrams)</td></tr>
<tr><td colspan="2">Subtract fractions with denominators that are multiples of the same number, e.g. $\frac{5}{6}-\frac{1}{3}=\frac{5}{6}-\frac{2}{6}=\frac{3}{6}$ within 1</td><td colspan="2">Subtract fractions with denominators that are multiples of the same number that involve mixed numbers,
e.g. $1\frac{1}{3}-\frac{5}{6}=1\frac{2}{6}-\frac{5}{6}=\frac{3}{6}=\frac{1}{2}$;
$5\frac{5}{6}-3\frac{1}{3}=5\frac{5}{6}-3\frac{2}{6}=2\frac{3}{6}=2\frac{1}{2}$</td></tr>
<tr><td>No equivalent objective in Y4</td><td colspan="2">Use concrete materials or pictorial representations to demonstrate conversion from an improper fraction to a mixed number,
e.g. seeing that $\frac{7}{5}$ is the same as 1 whole one and $\frac{2}{5}$ of another whole one</td><td colspan="2">Use multiples of the denominator to identify how many whole ones can be made from the improper fraction and how many fractional parts remain,
e.g. $\frac{21}{5}$ can be converted using $\frac{5}{5}$ is 1,
$\frac{10}{5}$ is 2, $\frac{15}{5}$ is 3, $\frac{20}{5}$ is 4 and $\frac{1}{5}$ remains so $\frac{21}{5}=4\frac{1}{5}$</td><td>Write statements > 1 as a mixed number
(e.g. $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$)</td></tr>
<tr><td>No equivalent objective in Y4</td><td>Use concrete materials or pictorial representations to multiply proper fractions by whole numbers where the answer is less than 1,
e.g. $\frac{1}{7}$ x 4 = $\frac{4}{7}$</td><td>Use partitioning to multiply mixed numbers by whole numbers where the fractional part of the answer is less than 1,
e.g. $3\frac{1}{5}$ x 4 = (3 x 4) + ($\frac{1}{5}$ x 4) = $12\frac{4}{5}$</td><td>Use concrete materials or pictorial representations to multiply proper fractions by whole numbers where the answer is greater than 1,
e.g. $\frac{3}{7}$ x 4 = $\frac{12}{7}=1\frac{5}{7}$</td><td>Use partitioning to multiply mixed numbers by whole numbers where the fractional part of the answer is greater than 1,
e.g. $3\frac{4}{5}$ x 7 = (3 x 7) + ($\frac{4}{5}$ x 7) = $21\frac{28}{5}$
= 21 + $5\frac{3}{5}=26\frac{3}{5}$</td><td>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</td></tr>
<tr><td>No equivalent objective in Y4</td><td>Recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per hundred’</td><td>Write percentages as a fraction with denominator 100, and as a decimal</td><td>Given a fraction with denominator of 100 or a decimal to two decimal places give the equivalent percentage</td><td>Recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per hundred’, and write percentages as a fraction with denominator 100, and as a decimal</td></tr>
<tr><td>Solve simple measure and money problems involving fractions and decimals to two decimal places</td><td colspan="4">Children need frequent access to arrange of contexts using the content from all of the above.
See Using and Applying, Contextual Learning and Assessment section form the Lancashire Mathematics Planning Disc</td><td>Solve problems involving fractions and decimals to three places</td></tr>
</table>

	Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	Given the following fractions $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and fractions with a denominator of a multiple of 10 or 25, give the equivalent percentage and vice versa	Find percentages of amounts where they are equivalent to the fractions $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and fractions with a denominator of a multiple of 10 or 25	**Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and fractions with a denominator of a multiple of 10 or 25**

Geometry – Properties of Shapes	End of Year 4 expectation	Learning and Progression Statements						End of Year 5 expectation
	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes **Identify lines of symmetry in 2-D shapes presented in different orientations**	There are no steps towards this end of year objective						**Distinguish between regular and irregular polygons based on reasoning about equal sides and angles**
	Continue to identify horizontal and vertical lines and pairs of perpendicular and parallel lines	**Use the properties of rectangles to deduce related facts and find missing lengths e.g. given the area of a rectangle and the length of one side, calculate the length of the other sides**		**Use the properties of rectangles to deduce related facts and find missing angles at a vertex when diagonals have been drawn and one angle is given**		**Use the properties of rectangles to deduce related facts and find missing angles where the diagonals bisect when one angle is given**		**Use the properties of rectangles to deduce related facts and find missing lengths and angles**
	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	Identify cubes and cuboids from 2-D pictures of them	Identify other 3-D shapes from 2-D pictures of them	Identify a net of a cube from a range of nets	Identify a net of other cuboids from a range of nets	Identify a net of other prisms and pyramids from a range of nets		**Identify 3-D shapes, including cubes and other cuboids, from 2-D representations**
	Identify acute and obtuse angles and compare and order angles up to two right angles by size	Identify reflex angles as those greater than 180° where two lines meet	Compare all types of angles including reflex angles	Know that angles are measured in degrees °	Estimate acute angles using knowledge of a right angle and fractions of a right angle e.g. half a right angle is 45°; one third of a right angle is 30° and two thirds of a right angle is 60°	Estimate obtuse angles using knowledge of a right angle and fractions of a right angle e.g. half a right angle is 45°; one third of a right angle is 30° and two thirds of a right angle is 60°, and adding these to 90°	Estimate reflex angles using knowledge of a right angle and fractions of a right angle e.g. half a right angle is 45°; one third of a right angle is 30° and two thirds of a right angle is 60°, and adding these to either 180° or 270°	**Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles**

	Identify acute and obtuse angles and compare and order angles up to two right angles by size	**Measure acute angles to the nearest degree**	**Measure obtuse angles to the nearest degree**	**Measure reflex angles to the nearest degree by either using a 360° protractor or by calculating the reflex angle by measuring the complementary acute or obtuse angle and subtracting this angle from 360°**	**Draw given angles, and measure them in degrees (°)**
		Draw acute angles to the nearest degree	**Draw obtuse angles to the nearest degree**	**Draw reflex angles to the nearest degree by either using a 360° protractor or by drawing the complementary acute or obtuse angle that gives a sum of 360°, e.g. to draw an angle of 295°, draw the complementary acute angle of 65° but label the reflex angle**	
	Identify acute and obtuse angles and compare and order angles up to two right angles by size	**Use information given to calculate missing angles at a point on a straight line and half a turn (total 180°)**	**Use information given to calculate missing angles at a point and one whole turn (total 360°)**	**Identify angles that are other multiples of 90°, e.g. when jumping a snowboarder rotates through one and a half turns. Through how many degrees has the snowboarder turned? Answer: 540°**	**Identify:** **- angles at a point and one whole turn (total 360°)** **- angles at a point on a straight line and half a turn (total 180°)** **- other multiples of 90°**

Geometry – Position and Direction	End of Year 4 expectation	Learning and Progression Statements						End of Year 5 expectation
	Describe positions on a 2-D grid as coordinates in the first quadrant	This is consolidation of Year 4 learning and therefore there are no steps towards this end of year expectation						***Describe positions on the first quadrant of a coordinate grid***
	Plot specified points and draw sides to complete a given polygon	This is consolidation of Year 4 learning and therefore there are no steps towards this end of year expectation						***Plot specified points and complete shapes***
	Describe movements between positions as translations of a given unit to the left/right and up/down	Identify, describe and represent the position of a shape following a reflection in a horizontal or vertical mirror line when the shape has all sides parallel or perpendicular to the mirror line and is not touching the mirror line	Identify, describe and represent the position of a shape following a reflection in a horizontal or vertical mirror line when the shape has some sides that are not parallel or perpendicular to the mirror line and is not touching the mirror line	Identify, describe and represent the position of a shape following a reflection in a horizontal or vertical mirror line when the shape has no sides parallel or perpendicular to the mirror line and is not touching the mirror line	Identify, describe and represent the position of a shape following a reflection in a horizontal or vertical mirror line when the shape has all sides parallel or perpendicular to the mirror line and is touching the mirror line	Identify, describe and represent the position of a shape following a reflection in a horizontal or vertical mirror line when the shape has some sides that are not parallel or perpendicular to the mirror line and is touching the mirror line	Identify, describe and represent the position of a shape following a reflection in a horizontal or vertical mirror line when the shape has no sides parallel or perpendicular to the mirror line and is touching the mirror line	**Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed**
		Describe the translation for a shape that moves in one direction (left/right or up/down)	Describe the translation for a shape that moves in two directions (left/right and up/down)		Identify and represent the position of a shape following a translation in one direction (left/right or up/down)	Identify and represent the position of a shape following a translation in two directions (left/right and up/down)		

	End of Year 4 expectation	Learning and Progression Statements				End of Year 5 expectation
Statistics	***Use a variety of sorting diagrams to* compare and classify *numbers and* geometric shapes based on their properties and sizes**	Interpret information in a variety of sorting diagrams		Complete information in a variety of sorting diagrams	Identify the properties used to sort a set of numbers or shapes in a completed diagram	***Complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)***
	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts, time graphs	Read and interpret information in a range of tables with different contexts	Complete tables by identifying missing information	Read and interpret information in a range of timetables with different contexts	Complete timetables by identifying missing information	**Complete, read and interpret information in tables and timetables**
	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	Answer questions which ask 'How many/much more…?' or 'How many fewer/much less…?' when comparing two categories in a data set		Answer questions which ask 'How many in total…?' for different data readings		**Solve comparison, sum and difference problems using information presented in *all types of graph including* a line graph**
	No equivalent objective in Y4	Calculate the mode of a set of values	Calculate the range of a set of values	Calculate the median for an odd number of values	Calculate the median for an even number of values	***Calculate and interpret the mode, median and range***
		Identify when it is appropriate to use mode, median and range				

	End of Year 4 expectation	Learning and Progression Statements					End of Year 5 expectation
Measurement	**Estimate, compare and calculate different measures**	This is consolidation of Year 4 learning and therefore there are no steps towards this end of year expectation					***Use, read and write standard units of length and mass***
	Estimate, compare and calculate different measures	Use knowledge of points of reference to estimate the capacity of different containers	Use knowledge of points of reference to estimate the volume of liquid in a container	Use cm^3 blocks to build cuboids of a given volume	Calculate the volume of different cuboids when dimensions are given	Estimate the volume of cubes and cuboids by estimating their dimensions	**Estimate *(and calculate)* volume ((e.g., using 1 cm^3 blocks to build cuboids (including cubes)) and capacity (e.g. using water)**
	No equivalent objective in Y4	Understand that the units of liquid volume ml and units of solid volume cm^3 have the same value					***Understand the difference between liquid volume and solid volume***
	Order temperatures including those below 0°C	Consolidation of Year 4					***Continue to order temperatures including those below 0°C***
	Convert between different units of measure [e.g. kilometre to metre; hour to minute]	Convert km (up to 3 decimal places) to m, and vice versa where 0 is not used as a place holder, e.g. 3756m = 3.756km			Convert km (up to 3 decimal places) to m and vice versa where 0 is used as a place holder, e.g. 72m = 0.072km		**Convert between different units of metric measure**
		Convert kg (up to 3 decimal places) to g and vice versa where 0 is not used as a place holder, e.g. 7582g = 7.582kg			Convert kg (up to 3 decimal places) to g and vice versa where 0 is used as a place holder, e.g. 604g = 0.604kg		
		Convert l (up to 3 decimal places) to ml and vice versa where 0 is not used as a place holder, e.g. 2.759l = 2759ml			Convert l (up to 3 decimal places) to ml and vice versa where 0 is used as a place holder, e.g. 0.093l = 93ml		
	Convert between different units of measure [e.g. kilometre to metre; hour to minute]	Understand and use approximate equivalences between inches and centimetres when given the conversion graph or conversion fact that 1 inch ≈ 2.54cm		Understand and use approximate equivalences between feet and centimetres when given the conversion graph or conversion fact that 1 foot ≈ 30cm		Understand and use approximate equivalences between yards and metres when given the conversion graph or conversion fact that 1 yard ≈ 90cm	**Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints**
		Understand and use approximate equivalences between pounds and kilograms when given the conversion graph or conversion fact that 1 lb ≈ 500g			Understand and use approximate equivalences between ounces and grams when given the conversion graph or conversion fact that 1 oz ≈ 30g		
		Understand and use approximate equivalences between pints and litres when given the conversion graph or conversion fact that 1 pint ≈ 0.6 litres			Understand and use approximate equivalences between gallons and litres when given the conversion graph or conversion fact that 1 gallon ≈ 4.5 litres		
	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Identify the perimeter of composite rectilinear shapes through accurate measuring to the nearest mm		Identify the length of missing sides of composite rectilinear shapes		Calculate the perimeter of a composite rectilinear shape where the lengths of some sides are not given	**Measure/calculate the perimeter of composite rectilinear shapes**

	Know area is a measure of surface within a given boundary **Find the area of rectilinear shapes by counting squares**	Estimate the area of irregular shapes using a square centimetre overlay	Use knowledge of arrays to understand why the area of rectangles can be calculated using length multiplied by width	Calculate the area of rectangles	Compare rectangles by area	**Calculate and compare the area of rectangle, use standard units square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes**
	Read, write and convert time between analogue and digital 12- and 24-hour clocks	This is consolidation of Year 4 learning and therefore there are no steps towards this end of year expectation				***Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks***
	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days *and problems involving money and measures*	Convert between different units of time where long multiplication is required e.g. how many hours are there in a fortnight?				**Solve problems involving converting between units of time**
	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days *and problems involving money and measures*	Children need frequent access to a range of contexts using the content from all of the above. See Using and Applying, Contextual Learning and Assessment sections from the Lancashire Mathematics Planning Disc.				**Use all four operations to solve problems involving measure using decimal notation, including scaling**