Year 4 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="9">Number and Place Value</td><td>End of Year 3 expectation</td><td colspan="6">Learning and Progression Statements</td><td>End of Year 4 expectation</td></tr>
<tr><td>Count from 0 in multiples of 4, 8, 50 and 100</td><td colspan="2">Count in multiples of 1000 from 0 or any multiple of 1000</td><td colspan="2">Count in multiples of 25 from 0 or any multiple of 25</td><td>Count in multiples of 9 from 0 or any multiple of 9</td><td>Count in multiples of 6 from 0 or any multiple of 6</td><td>Count in multiples of 7 from 0 or any multiple of 7</td><td>Count in multiples of 6, 7, 9, 25 and 1000</td></tr>
<tr><td>No equivalent objective in Year 3</td><td colspan="7">Label positive and negative numbers on a demarcated number line (where the counting step is one)</td><td>Count backwards through zero to include negative numbers</td></tr>
<tr><td>Count up and down in tenths</td><td colspan="2">Count up in fractional hundredths ($\frac{1}{100}$) including where tenths boundaries are crossed, e.g. $\frac{78}{100}$, $\frac{79}{100}$, $\frac{80}{100}$, $\frac{81}{100}$, $\frac{82}{100}$,</td><td colspan="2">Count down in fractional hundredths ($\frac{1}{100}$) including where tenths boundaries are crossed, e.g. $\frac{82}{100}$, $\frac{81}{100}$, $\frac{80}{100}$, $\frac{79}{100}$, $\frac{78}{100}$,</td><td>Count up and down in fractional hundredths ($\frac{1}{100}$) including where ones boundaries are crossed, e.g. $\frac{98}{100}$, $\frac{99}{100}$, 1, $\frac{1}{100}$, $\frac{2}{100}$, …</td><td>Count up and down in decimal hundredths (0.01) including where tenths boundaries are crossed, e.g. 1.42, 1.41, 1.40, 1.39, 1.38</td><td>Use knowledge of equivalence to refine the sequence, e.g. 1.42, 1.41, <u>1.4</u>, 1.39, 1.38</td><td>Count up and down in decimal hundredths (0.01) including where ones boundaries are crossed, e.g. 5.97, 5.98, 5.99, 6, 6.01, 6.02</td><td>Count up and down in hundredths</td></tr>
<tr><td rowspan="2">Read and write numbers up to 1000 in numerals and in words</td><td colspan="2">Read multiples of 1000 to 10 000 in numerals and in words</td><td colspan="2">Read multiples of 100 to 10 000 in numerals and in words</td><td colspan="2">Read numbers to 10 000 where 0 is not used as a place holder</td><td colspan="2">Read numbers to 10 000 where 0 is used as a place holder</td><td rowspan="2">Read and write numbers to at least 10 000</td></tr>
<tr><td colspan="2">Write multiples of 1000 to 10 000 in numerals and in words</td><td colspan="2">Write multiples of 100 to 10 000 in numerals and in words</td><td colspan="2">Write numbers to 10 000 where 0 is not used as a place holder</td><td colspan="2">Write numbers to 10 000 where 0 is used as a place holder</td></tr>
<tr><td rowspan="2">Read and write numbers with one decimal place</td><td colspan="4">Read numbers with two decimal places where 0 is not used as a place holder</td><td colspan="4">Read numbers with two decimal places where 0 is used as a place holder</td><td rowspan="2">Read and write numbers with up to two decimal places</td></tr>
<tr><td colspan="4">Write numbers with two decimal places where 0 is not used as a place holder</td><td colspan="4">Write numbers with two decimal places where 0 is used as a place holder</td></tr>
<tr><td>Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</td><td colspan="4">Identify a four-digit number up to 10 000 made from concrete materials such as base 10 apparatus or representations of this</td><td colspan="4">Make and identify a four-digit number up to 10 000 using models such as place value counters, an abacus and arrow cards</td><td>Recognise the place value of each digit in a four-digit number</td></tr>
<tr><td>Identify the value of each digit to one decimal place</td><td colspan="2">Use concrete materials to make a number with two decimal places e.g. straws</td><td colspan="2">Use a place value chart to identify the value of each digit to two decimal places</td><td colspan="2">Identify the value of each digit to two decimal places in a variety of ways e.g. the value of the digit 7 in 53.27 is seven hundredths, $\frac{7}{100}$ or 0.07</td><td colspan="2">Represent numbers to two decimal places using £1, 10p and 1p coins</td><td>Identify the value of each digit to two decimal places</td></tr>
</table>

Partition numbers in different ways (e.g. 146 = 100+40+6 and 146 = 130+16)	Partition a four-digit number (represented using place value counters) into thousands, hundreds, tens and ones, e.g. 2643 is 2 thousands (2000), 6 hundreds, (600) 4 tens (40) and 3 ones (3)	Partition a four-digit number (represented using place value counters) into thousands, hundreds, tens and ones in different ways, e.g. 2643 is 2 thousand 5 hundred (2500) and 1 hundred, 4 tens and 3 ones (143)	Partition a four-digit number without the use of practical equipment into two groups in different ways	Partition a four-digit number without the use of practical equipment into two groups in different ways where one group is appropriate to the context e.g. 1500 + 2643 = 1500 + 2500 + 143		***Partition numbers in different ways (e.g. 2.3 = 2+0.3 & 1+1.3)***
	Partition numbers with one decimal place (represented using straws or place value counters) into ones and tenths, e.g. 3.4 is 3 ones (3) and 4 tenths (0.4)	Partition numbers with one decimal place (represented using straws or place value counters) into ones and tenths in different ways, e.g. 3.4 is 2 ones (2) and 1 one and 4 tenths (1.4)	Partition numbers with one decimal place without the use of practical equipment into two groups in different ways			
Identify, represent and estimate numbers using different representations (including the number line)	Identify and represent numbers up to 10 000 using models such as place value counters, an abacus and arrow cards	Correctly place multiples of 100 on a number line with multiples of 1000 marked but not labelled (with start and end labelled 0 and 10 000)	Correctly place any number on a number line with multiples of 1000 marked but not labelled (with start and end labelled 0 and 10 000)	Correctly place any number on a number line with multiples of 1000 marked but not labelled (with a variety of start and end points e.g. 2500 to 7500)		**Identify, represent and estimate numbers using different representations *(including the number line)***
	Identify and represent numbers with up to two decimal places using models such as straws, place value counters and arrow cards	Correctly place multiples of one tenth (0.1) on a number line with multiples of 0.1 marked but not labelled (with start and end labelled 0 and 1)	Correctly place multiples of one hundredth (0.01) on a number line with multiples of 0.1 marked but not labelled (with start and end labelled 0 and 1)			
Compare and order numbers up to 1000	Compare two numbers up to 10 000 when represented using models such as place value counters saying which number is greater or less and use <, > and = correctly. Pay particular attention to numbers that have the same digits, e.g. 2634 and 2643	Compare three or more numbers up to 10 000 when represented using models such as place value counters saying which numbers are greater or less and use <, > and = correctly. Pay particular attention to numbers that have some of the same digits, e.g. 3615 < 3652 > 3625	Order numbers up to 10 000 with different numbers of digits, when represented using models such as place value counters saying which numbers are greater or less	Order numbers up to 10 000 with different numbers of digits, saying which numbers are greater or less		**Order and compare numbers beyond 1000**
Compare and order numbers with one decimal place	Compare two or more numbers with tenths and hundredths using concrete materials such as straws, saying which has more and less and use <, > and = correctly. Pay particular attention to numbers that have the same digits, e.g. 0.23 and 0.32	Order numbers with tenths and hundredths using concrete materials such as straws, saying which numbers are greater or less. Pay particular attention to numbers that have the same digits, e.g. 0.43, 0.61, 0.54	Compare two or more numbers with ones, tenths and hundredths using concrete materials such as straws, saying which has more and less and use <, > and = correctly. Pay particular attention to numbers that have the same digits, e.g. 1.56, 1.65 and 6.15	Order numbers with ones, tenths and hundredths using concrete materials such as straws, saying which numbers are greater or less. Pay particular attention to numbers that have the same digits, e.g. 5.61, 1.56 and 6.15	Compare numbers with the same number of decimal places saying which number is more or less and use <, > and = correctly. Pay particular attention to numbers that have the same digits, e.g. 115.62 and 161.52	Order numbers with the same number of decimal places saying which numbers are greater or less. Pay particular attention to numbers that have the same digits, e.g. 65.12, 21.56 and 26.15	***Order and* compare numbers with the same number of decimal places up to two decimal places**
Find 1, 10 or 100 more or less than a given number	Identify the number 1000 more and less than a given number with up to four-digits recognising which digits stay the same and which digits change		Identify the number one tenth (0.1) more and less than a given number with up to one decimal place, where the ones digit stays the same e.g. one tenth more than 2.4		Identify the number one tenth (0.1) more and less than a given number with up to one decimal place, where the ones digit changes e.g. one tenth less than 6		**Find *0.1, 1, 10, 100 or* 1000 more or less than a given number**

Round numbers to at least 1000 to the nearest 10 or 100	Identify the multiples of 10 immediately before and after a given four-digit number	Round numbers with up to four-digits to the nearest ten, e.g. 4356 rounds to 4360	Identify the multiples of 100 immediately before and after a given four-digit number	Round numbers with up to four-digits to the nearest hundred, e.g. 4356 rounds to 4400	Identify the multiples of 1000 immediately before and after a given four-digit number	Round numbers with up to four-digits to the nearest thousand, e.g. 4356 rounds to 4000			**Round any number to the nearest 10, 100 or 1000**
Round numbers to at least 1000 to the nearest 10 or 100	Identify the whole numbers immediately before and after a number to one decimal place where the number is less than 10		Round numbers with one decimal place to the nearest whole number where the number is less than 10		Identify the whole numbers immediately before and after a number to one decimal place where the number is up to 10 000				**Round decimals (one decimal place) to the nearest whole number**
Find the effect of multiplying a one- or two-digit number by 10 and 100, identify the value of the digits in the answer	Use concrete materials to model the effect of dividing a one-digit number by 10 e.g. exchange each straw for a tenth of a straw and identify what changes and what stays the same	Describe the effect of dividing a one-digit number by 10, e.g. 7 ÷ 10 = 0.7 The 7 has moved one place to the right; from the ones column to the tenths column. A place holder (zero) is needed in the ones column	Use concrete materials to model the effect of dividing a two-digit number by 10 e.g. exchange each bundle of ten straws for a single straw, and each straw for a tenth of a straw and identify what changes and what stays the same	Describe the effect of dividing a two-digit number by 10, e.g. 73 ÷ 10 = 7.3 Both digits have moved one place to the right	Use concrete materials to model the effect of dividing a one-digit number by 100 e.g. exchange each straw for a hundredth of a straw and identify what changes and what stays the same	Describe the effect of dividing a one-digit number by 100, e.g. 7 ÷ 100 = 0.07 The 7 has moved two places to the right; from the ones column to the hundredths column. A place holder (zero) is needed in the ones and tenths columns	Use concrete materials to model the effect of dividing a two-digit number by 100 e.g. exchange each bundle of ten straws for a tenth straw, and each straw for a hundredth of a straw and identify what changes and what stays the same	Describe the effect of dividing a two-digit number by 100, e.g. 73 ÷ 100 = 0.73 Both digits have moved two places to the right	**Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer**
Describe and extend number sequences involving counting on or back in different steps	From given complete sequences, identify whether these are addition / subtraction (constant step size) or multiplication / division		Identify and describe the rule in a multiplication / division number sequence by identifying the relationship between two adjacent numbers		Extend number sequences by using the identified rule within children's number competence e.g. 2, 4, 8, 16, …; 10 000, 1000, 100, …				***Describe and extend number sequences involving counting on or back in different steps, including sequences with multiplication and division steps***
Read Roman numerals from I to XII	Know that L represents 50 and C represents 100	Represent numbers with only additive properties i.e. not ending in 4 or 9	Know that I can only be used before V and X to represent 1 less than 5 (4) and 1 less than 10 (9)	Represent any number up to 50	Know that X can only be used before L and C to represent 10 less than 50 (40) and 10 less than 100 (90)	Represent any number up to 100	Compare and contrast Roman numeral system and modern day number system		**Read Roman numerals to 100 and know that over time, the numeral system changed to include the concept of zero and place value**
Solve number problems and concrete problems involving these ideas	**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 and with increasingly large positive numbers**

	End of Year 3 expectation	Learning and Progression Statements						End of Year 4 expectation
Number – Addition and Subtraction	***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. 250 + 130	Recognise that the numbers in calculations can be reordered to make calculating more efficient e.g. 18 + 6 – 8 becomes 18 – 8 + 6 and use this strategy where appropriate *(This should be supported by concrete materials, pictures or jottings)*	Recognise calculations that require counting on or back mentally e.g. 243 + 230 (counting on in hundreds and then in tens) and use this strategy where appropriate *(This should be supported by concrete materials, pictures or jottings)*	Recognise calculations that require mental partitioning e.g. 122 - 35 and use this strategy where appropriate *(This should be supported by concrete materials, pictures or jottings)*	Recognise calculations that require counting on mentally to find the difference e.g. 203 - 96 and use this strategy where appropriate *(This should be supported by concrete materials, pictures or jottings)*	Recognise calculations that require counting on or back mentally, bridging through a multiple of 10 efficiently e.g. 230 - 72 becomes 230 – 30 – 40 – 2 and use this strategy where appropriate *(This should be supported by concrete materials, pictures or jottings)* Recognise calculations that require a mental compensation method e.g. 213 - 58 becomes 213 - 60 + 2 and use this strategy where appropriate *(This should be supported by concrete materials, pictures or jottings)*	***Select a mental strategy appropriate for the numbers involved in the calculation***
	Derive and use addition and subtraction facts for 100	There are no steps towards this end of year expectation						***Recall and use addition and subtraction facts for 100***
	Derive and use addition and subtraction facts for multiples of 100 totalling 1000	There are no steps towards this end of year expectation						***Recall and use +/- facts for multiples of 100 totalling 1000***
	Derive and use addition and subtraction facts for 100 Derive and use addition and subtraction facts for multiples of 100 totalling 1000	Derive and use addition and subtraction facts for 1 using number lines, bar model and related facts		Derive and use addition and subtraction facts for 10 using number lines, bar model and related facts		Recognise that, when calculating addition facts to 10, the ones total 9 and the tenths total 1		***Derive and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)***

<table>
<tr><td rowspan="4"></td><td>Add and subtract numbers mentally, including:
- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds</td><td>Add and subtract a two-digit number to/from another two-digit number including crossing the hundreds boundary,
e.g. 87 + 35
(This could be supported by jottings or a number line)</td><td>Add and subtract a three-digit number to/from a three-digit number where no boundaries are crossed, e.g. 765 – 241
(This could be supported by jottings or a number line)</td><td>Add and subtract a two-digit number to/from a three-digit number including crossing the hundreds boundary, e.g. 122 – 35
(This could be supported by jottings or a number line)</td><td>Add and subtract a three-digit number to/from a three-digit number including crossing the hundreds boundary, e.g. 205 – 197
(This could be supported by jottings or a number line)</td><td>Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place</td></tr>
<tr><td colspan="2">Add and subtract a number with one decimal place to/from a whole number, e.g. 6.3 + 4
(This could be supported by jottings or a number line)</td><td colspan="2">Add and subtract a number with one decimal place to/from another where the ones boundary is not crossed, e.g. 5.8 – 2.5
(This could be supported by jottings or a number line)</td><td>Add and subtract a number with one decimal place to/from another where the ones boundary is crossed, e.g. 14.7 + 8.6
(This could be supported by jottings or a number line)</td></tr>
<tr><td>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</td><td>Add two numbers with four digits using formal written methods of columnar addition with exchange
e.g. 2326 + 3845</td><td>Add more than two numbers with four digits using formal written methods of columnar addition with exchange,
e.g. 2468 + 3326 + 3782</td><td>Add more than two numbers with up to four digits using formal written method of columnar addition,
e.g. 673 + 5394 + 3027</td><td>Add two numbers with one decimal place using formal written methods of columnar addition with exchange,
e.g. 54.7 + 73.6</td><td>Add more than two numbers with up to one decimal place using formal written methods of columnar addition with exchange,
e.g. 268 + 34.7 + 356.5</td><td>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></tr>
<tr><td>Subtract two numbers with four digits using formal written methods of columnar subtraction with exchange
e.g. 3845 - 2588</td><td>Subtract two numbers with four digits using formal written methods of columnar subtraction with exchange where the greater number has 0 as a place holder
e.g. 3805 - 2588</td><td>Subtract two numbers with one decimal place using formal written methods of columnar subtraction with exchange,
e.g. 63.7 - 37.8</td><td>Subtract two numbers with one decimal place using formal written methods of columnar subtraction with exchange where the greater number has 0 as a place holder,
e.g. 50.7 - 23.8</td></tr>
<tr><td>Estimate the answer to a calculation and use inverse operations to check answers</td><td colspan="2">Use rounding to estimate the answer to a calculation, e.g. 2423 + 389 could be estimated as 2400 + 400 = 2800</td><td colspan="2">Use inverse to check the answer to a calculation, e.g. 4423 + 2389 = 6812 can be checked by carrying out either of the following calculations correctly:
6812 – 4423 or 6812 – 2389</td><td>Estimate; use inverse operations to check answers to a calculation</td></tr>
<tr><td>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</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 addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</td></tr>
<tr><td></td><td>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</td><td colspan="4">Represent and solve a problem using structured pictorial representations such as the bar model</td><td>Solve addition and subtraction problems involving missing numbers</td></tr>
</table>

Number – Multiplication and Division	End of Year 3 expectation	Learning and Progression Statements							End of Year 4 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)***
	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	Use appropriate factor pairs and commutativity in mental calculations e.g. 300 x 6 = 3 x 100 x 6 which becomes 3 x 6 x 100 = 18 x 100				**Recognise and use factor pairs and commutativity in mental calculations**
	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	Recall and use multiplication and division facts for the 6 multiplication table	Recall and use multiplication and division facts for the 11 multiplication table	Recall and use multiplication and division facts for the 9 multiplication table	Recall and use multiplication and division facts for the 7 multiplication table	Recall and use multiplication and division facts for the 12 multiplication table			**Recall multiplication and division facts for multiplication tables up to 12 × 12**
	Derive and use doubles of all numbers to 100 and corresponding halves ***Derive and use doubles of all multiples of 50 to 500***	Use partitioning to double any number with up to four digits where the answer is less than 10 000	Use related facts to double a number of tenths, e.g. double 0.7	Use partitioning to double a number with ones and tenths, e.g. double 6.8	Use partitioning to halve any four digit number where each digit is even	Use partitioning to halve any four digit even number where some of the digits are odd e.g. 4524 could be partitioned into 4000 + 500 + 20 + 4 or 4400 + 100 + 24	Use partitioning to halve a number with ones and tenths where both digits are even	Use partitioning to halve any number with ones and tenths where the tenths digit is even e.g. half of 3.6 could be partitioned into 3 + 0.6 or 2 + 1.6	***Use partitioning to double or halve any number, including decimals to one decimal place***
	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	Recognise that multiplying by 0 gives a product of 0	Recognise that multiplying a number by 1 does not change the number	Recognise the relationship between a known fact and a related calculation e.g. 6 x 4 = 24 and 600 x 4 = 2400	Represent multiplication of three numbers using arrays e.g. 2 x 3 x 4 can be shown using a 2 x 3 array four times	Use commutativity to reorder multiplication of three numbers to simplify the calculation e.g. 4 x 7 x 5 becomes 4 x 5 x 7 = 20 x 7			**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**
		Recognise that dividing a number by 1 does not change the number		Use knowledge of place value and multiplication facts to divide related larger numbers e.g. 630 ÷ 9 = 70		Divide a two-digit number by a one-digit number using a partitioning strategy e.g. 96 ÷ 4 becomes (80 ÷ 4) + (16 ÷ 4)			

	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	Use partitioning to calculate a three-digit number multiplied by a single digit number using grid method					**Multiply two-digit and three-digit numbers by a one-digit number using formal written layout**
	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	Divide two-digit numbers (beyond the multiplication facts) by a single digit number using the chunking method where there is no remainder e.g. 72 ÷ 4	Divide two-digit numbers (beyond the multiplication facts) by a single digit number using the chunking method where there is a remainder e.g. 56 ÷ 3	Divide three-digit numbers by a single digit number using the chunking method where there is no remainder e.g. 248 ÷ 4	Divide three-digit numbers by a single digit number using the chunking method, making the calculation more efficient by subtracting more than one multiple of 10 of the divisor e.g. 248 ÷ 4 by subtracting 240 (60 groups of 4) and 8 (2 groups of 4)	Divide three-digit numbers by a single digit number efficiently using the chunking method where there is a remainder e.g. 176 ÷ 6	***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***
	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	Estimate multiplication by rounding to the nearest multiple of 10 or 100 and using related facts e.g. 384 x 6 ≈ 400 x 6			Use inverse to check the answer to a calculation, e.g. 342 x 6 = 2052 can be checked by carrying out the following calculation correctly: 2052 ÷ 6		***Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy***
		Estimate division by rounding to the nearest multiple of 10 of the divisor and using related facts e.g. 352 ÷ 6 ≈ 360 ÷ 6			Use inverse to check the answer to a calculation, e.g. 256 ÷ 4 = 64 can be checked by carrying out the following calculation correctly: 64 x 4		

	Solve problems, including missing number problems, involving multiplication and division (and interpreting remainders), including positive integer scaling problems and correspondence problems in which 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 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**

	End of Year 3 expectation	Learning and Progression Statements					End of Year 4 expectation
Number – Fractions	***Show concretely or pictorially that a fraction is one whole number divided by another (e.g. $\frac{3}{4}$ can be interpreted as 3 ÷ 4)***	There are no steps towards this end of year expectation					***Understand that a fraction is one whole number divided by another (e.g. $\frac{3}{4}$ can be interpreted as 3 ÷ 4)***
	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	Where a fraction of an amount cannot be found by using known division facts, use pictorial representations, e.g. bar model, to find non-unit fractions of a set of objects, e.g. $\frac{3}{8}$ of 112		Find non-unit fractions of an amount by using division to find the unit fraction then multiplying to scale up by the numerator e.g. $\frac{4}{7}$ of 315 by calculating 315 ÷ 7 to find $\frac{1}{7}$ of 315 which is 45 then 45 x 4 to find $\frac{4}{7}$ of 315 which is 180		***Recognise, find and write fractions of a discrete set of objects including those with a range of numerators and denominators***
	Recognise that tenths arise from dividing objects into 10 equal parts and in dividing one-digit numbers or quantities by 10	Use pictorial representations such as a 10 x 10 grid to show that $\frac{1}{100}$ of an object can be found by dividing the object into one hundred equal parts		Use pictorial representations such as a 10 x 10 grid to recognise that $\frac{1}{100}$ of an object can be found by dividing $\frac{1}{10}$ of the object into ten equal parts			**Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten**
	Count on and back in steps of $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$	Count on in steps of any unit fraction crossing ones boundaries e.g. $\frac{6}{8}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{2}{8}$, $1\frac{3}{8}$ …	Count back in steps of any unit fraction crossing ones boundaries e.g. $1\frac{2}{8}$, $1\frac{1}{8}$, 1 , $\frac{7}{8}$, $\frac{6}{8}$, $\frac{5}{8}$	Use knowledge of equivalence to begin to simplify fractions in the counting sequence e.g. $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$		***Count on and back in steps of unit fractions***
	Compare and order unit fractions, and fractions with the same denominators (including on a number line)	This is consolidation of Year 3 learning and therefore there are no steps towards this end of year expectation					***Compare and order unit fractions and fractions with the same denominators (including on a number line)***
	Recognise and show, using diagrams, equivalent fractions with small denominators	Use pictorial representations such as fraction walls to recognise where fractions are equivalent where one fraction is a unit fraction e.g. $\frac{1}{6}$ is the same as $\frac{3}{18}$		Use pictorial representations such as fraction walls to recognise where fractions are equivalent where both fractions are non-unit fractions e.g. $\frac{3}{4}$ is the same as $\frac{9}{12}$			**Recognise and show, using diagrams, families of common equivalent fractions**
	No equivalent objective in Year 3	Understand the hundredths heading in place value columns represents a given number of fractional hundredths, e.g. $\frac{3}{100}$ is equal to 0.03	Recognise and write decimal equivalents for any number of hundredths less than $\frac{10}{100}$ e.g. $\frac{7}{100}$ is 0.07	Recognise that $\frac{10}{100}$ is equivalent to $\frac{1}{10}$ or 0.1	Recognise that $\frac{20}{100}$ is equivalent to $\frac{2}{10}$ or 0.2 and so on	Write any number of hundredths in fraction and decimal form e.g. $\frac{47}{100}$ is 0.47	**Recognise and write decimal equivalents of any number of tenths or hundredths**

	Recognise and show, using diagrams, equivalent fractions with small denominators	Use concrete materials (such as money) or pictorial representations (such as a 10 x 10 grid) to show that $\frac{1}{2}$ is the same as $\frac{50}{100}$ which is 0.50 or 0.5	Use concrete materials (such as money) or pictorial representations (such as a 10 x 10 grid) to show that $\frac{1}{4}$ is the same as $\frac{25}{100}$ which is 0.25	Use concrete materials (such as money) or pictorial representations (such as a 10 x 10 grid) to show that $\frac{3}{4}$ is the same as $\frac{75}{100}$ which is 0.75	**Recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$**
	Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$]	Use pictorial representations, such as fraction strips, to add and subtract fractions with the same denominator crossing a ones boundary, e.g. $\frac{5}{7}+\frac{4}{7}=\frac{9}{7}$	Add and subtract fractions with the same denominator crossing a ones boundary by adding or subtracting the numerators, e.g. $\frac{15}{9}-\frac{8}{9}=\frac{7}{9}$		**Add and subtract fractions with the same denominator *(using diagrams)***
	Solve problems that involve all of the above	**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 increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number**
	No equivalent objective in Year 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**			**Solve simple measure and money problems involving fractions and decimals to two decimal places**

Geometry – Properties of Shapes	End of Year 3 expectation	Learning and Progression Statements						End of Year 4 expectation
	Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	Identify properties of 2-D shapes including: sides – number of sides, where any are equal, parallel and perpendicular vertices – number of vertices angles – right, acute, obtuse and where angles are equal diagonals – number, if and how they intersect line symmetry		Know and use the terms: scalene, isosceles, equilateral regular and irregular		Name 2-D shapes including all triangles and quadrilaterals according to their properties		**Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes**
		Identify properties of 3-D shapes including: faces or surfaces – number of faces and/or surfaces, where any are congruent (identical), parallel and perpendicular edges – number of edges, parallel and perpendicular vertices – number of vertices axis of symmetry		Name 3-D shapes including all prisms and pyramids according to their properties				
	No equivalent objective in Year 3	Identify a vertical or horizontal line of symmetry in a shape		From a set of shapes, identify those with a vertical or horizontal line of symmetry and those without				**Identify lines of symmetry in 2-D shapes presented in different orientations**
	No equivalent objective in Year 3	Complete a simple symmetric figure using a vertical or horizontal line of symmetry		Complete a simple symmetric figure where the line of symmetry is not vertical or horizontal				**Complete a simple symmetric figure with respect to a specific line of symmetry**
		NB – the mirror line will dissect the figure						
	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	This is consolidation of Year 3 learning and therefore there are no steps towards this end of year expectation						***Continue to identify horizontal and vertical lines and pairs of perpendicular and parallel lines***
	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	Know that an angle less than a right angle is called 'acute' Know that an angle between a right angle and a straight angle is called 'obtuse'	Identify acute and obtuse angles where one of the lines is horizontal		Identify acute and obtuse angles where one of the lines is vertical		Identify acute and obtuse angles in any orientation		**Identify acute and obtuse angles and compare and order angles up to two right angles by size**
			Compare any two angles less than two right angles where one of the lines is horizontal, identifying which is greater and less	Order more than two angles less than two right angles where one of the lines is horizontal	Compare any two angles less than two right angles where one of the lines is vertical, identifying which is greater and less	Order more than two angles less than two right angles where one of the lines is vertical	Compare any two angles less than two right angles in any orientation, identifying which is greater and less	Order more than two angles less than two right angles in any orientation	

<table>
<tr><td rowspan="6">Geometry – Position and Direction</td><td>End of Year 3 expectation</td><td colspan="3">Learning and Progression Statements</td><td>End of Year 4 expectation</td></tr>
<tr><td rowspan="2">Describe positions on a square grid labelled with letters and numbers</td><td>Know that the x axis is horizontal</td><td>Know that vertical lines on a grid can be identified by the value on the x axis from which they originate</td><td rowspan="2">Know that the first number in a coordinate pair refers to the x value and the second number refers to the y value and read and write them using correct notation e.g. (x , y)</td><td rowspan="2">Describe positions on a 2-D grid as coordinates in the first quadrant</td></tr>
<tr><td>Know that the y axis is vertical</td><td>Know that horizontal lines on a grid can be identified by the value on the y axis from which they originate</td></tr>
<tr><td>Describe positions on a square grid labelled with letters and numbers</td><td colspan="2">Plot a single point on a coordinate grid from a given coordinate pair</td><td>Plot a given set of coordinate pairs</td><td>Plot specified points and draw sides to complete a given polygon</td></tr>
<tr><td rowspan="2">No equivalent objective in Year 3</td><td colspan="3">Describe movement of a specified point as a translation of a given unit using left and right e.g. four squares left</td><td rowspan="2">Describe movements between positions as translations of a given unit to the left/right and up/down</td></tr>
<tr><td colspan="3">Describe movement of a specified point as a translation of a given unit using up and down e.g. six squares up</td></tr>
</table>

	End of Year 3 expectation	Learning and Progression Statements					End of Year 4 expectation
Statistics	***Use sorting diagrams to compare and sort objects, numbers and common 2-D and 3-D shapes***	Use Venn diagrams with two intersecting sets to compare and sort objects, numbers and shapes including items that do not fit the criteria and placing these in the universal set (area outside the circles)					***Use a variety of sorting diagrams to*** **compare and classify *numbers and* geometric shapes based on their properties and sizes**
		Use two criteria Carroll diagrams to compare and sort objects, numbers and shapes (understanding that Carroll diagrams are labelled 'is' and 'is not')					
		NB – the criteria used for comparing and sorting should be consistent with the properties from the Year 4 curriculum e.g. multiples of 7 and even number or regular and contains at least one acute angle					
	Interpret and present data using bar charts, pictograms and tables	Interpret and present discrete data using bar charts and a scale appropriate to Year 4 counting and place value	Choose the appropriate scale when representing data in a bar chart	Explain what a time graph is showing e.g. a child might describe temperature increasing or decreasing at different times during a day	Present time graphs from given data using appropriate scales	Understand that discrete data that can only take specific, separate values and the data sets are not related to each other Understand that continuous data is data that can take on any value along a continuum	**Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts, time graphs**
	Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	Answer questions using time graphs by reading from labelled values e.g. what was the temperature at 3:00pm (where each hour is labelled on the x axis)			Answer questions using time graphs by reading from between labelled values e.g. what was the temperature at 1:30pm (where each hour is labelled on the x axis)		**Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs**

	End of Year 3 expectation	Learning and Progression Statements					End of Year 4 expectation
Measurement	**Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)**	Measure lengths (m/cm/mm) and use known measurements to make reasonable estimates including numbers to two decimal places	Compare the length of different objects including numbers to two decimal places	Add and subtract (including finding the difference) values of length including numbers to one decimal place (m/cm/mm)	Multiply and divide values of length (m/cm/mm)		**Estimate, compare and calculate different measures, including money in pounds and pence**
		Measure mass (kg/g) and use known measurements to make reasonable estimates including numbers to two decimal places	Compare the mass of different objects including numbers to two decimal places	Add and subtract (including finding the difference) values of mass including numbers to one decimal place (kg/g)	Multiply and divide values of mass (kg/g)		
		Measure volume/capacity (l/ml) and use known measurements to make reasonable estimates including numbers to two decimal places	Compare the volume/capacity of different objects including numbers to two decimal places	Add and subtract (including finding the difference) values of volume/capacity including numbers to one decimal place (l/ml)	Multiply and divide values of volume/capacity (l/ml)		
		Add and subtract amounts of money including money notation where the pence is a multiple of 10p e.g. £24.60 + £8.50		Multiply and divide amounts of money given in pence only e.g. 45p x 4			
	Continue to estimate and measure temperature to the nearest degree (°C) using thermometers	Place temperatures including negative numbers on a number line (this could be vertical)					***Order temperatures including those below 0°C***
	Understand perimeter is a measure of distance around the boundary of a shape **Measure the perimeter of simple 2-D shapes**	Recognise where sides are the same length in a rectangles, including squares and use this when measuring and calculating perimeter e.g. perimeter of a square is length of one side multiplied by 4; the perimeter of an oblong is the length + the width multiplied by 2	Calculate the perimeter of any rectilinear figure where all side lengths are given	Recognise where the sides are the same length in L and T shaped rectilinear figures and use this when measuring and calculating perimeter	Calculate the length of missing sides using known dimensions		**Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres**
	No equivalent objective in Year 3	There are no steps towards this end of year expectation					***Know area is a measure of surface within a given boundary***
	No equivalent objective in Year 3	Find the area of irregular shapes (including those with curved sides) by counting squares	Find the area of rectangles presented on squared paper where the sides are horizontal and vertical by counting squares	Use knowledge of arrays to find the area of rectangles by counting squares in groups	Find the area of other rectilinear shapes presented on squared paper where the sides are horizontal and vertical by counting squares	Find the area of rectangles presented on squared paper where the sides are not horizontal and vertical by counting half squares	**Find the area of rectilinear shapes by counting squares**

	No equivalent objective in Year 3	Know that: 10mm = 1cm 100cm = 1m 1000m = 1km and vice versa		Use the relationship between different units of length to identify the calculation necessary for conversion e.g. to convert between cm and m, divide the number of cm by 100 ***NB – there is no requirement in Year 4 to multiply and divide by 1000. Therefore when converting from m to km or vice versa children would use related facts and whole numbers e.g. 1km is 1000m so 4km is 4000m***	**Convert between different units of measure [e.g. kilometre to metre; hour to minute]**
		Know that: 1000g = 1kg and vice versa		***NB – there is no requirement in Year 4 to multiply and divide by 1000. Therefore when converting from g to kg or vice versa children would use related facts and whole numbers e.g. 1kg is 1000g so 12kg is 12 000g***	
		Know that: 1000ml = 1 litre and vice versa		***NB – there is no requirement in Year 4 to multiply and divide by 1000. Therefore when converting from ml to litres or vice versa children would use related facts and whole numbers e.g. 1 litre is 1000ml so 7 litres is 7000ml***	
		Know that: 60 seconds = 1 minute 60 minutes = 1 hour 24 hours = 1 day 7 days = 1 week and vice versa		Use the relationship between different units of time to identify the calculation necessary for conversion e.g. to convert between hours to minutes, multiply the number of hours by 60 ***NB – when multiplying by 24 or 60, the other value must be a single digit e.g. how many hours in 8 days?*** ***Children will only convert from larger to smaller units using multiplication***	
	Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	Know that 24 hour clock times are written using four digits e.g. 8:35am is 08:35 or 0835	Recognise that times on a digital 24 hour clock with an hour value between 0 and 12 are before midday (morning) and times between 12 and 24 are after midday (afternoon or night)	Calculate the analogue time from a given 24 hour clock time when the hour value is greater than 12	Tell the time on a 24-hour clock, e.g. 16:27 is 27 minutes past 4 in the afternoon	**Read, write and convert time between analogue and digital 12- and 24-hour clocks**
	Continue to recognise and use the symbols for pounds (£) and pence (p) and understand that the decimal point separates pounds/pence	Recognise how place value columns relate to money notation i.e. units/ones column relates to the number of £1 coins; tenths column relates to the number of equivalent 10p coins; hundredths column relates to the number of equivalent 1p coins				***Write amounts of money using decimal notation***
	Recognise that ten 10p coins equal £1 and that each coin is $\frac{1}{10}$ of £1	Recognise that one hundred 1p coins equal £1		Recognise that each 1p coin is $\frac{1}{100}$ of £1, hence 1p being written as £0.01 which is consistent with the columns in a place value chart		***Recognise that one hundred 1p coins equal £1 and that each coin is $\frac{1}{100}$ of £1***

	Solve problems involving money and measures and simple problems involving passage of time **Add and subtract amounts of money to give change, using both £ and p in practical contexts**	**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 converting from hours to minutes; minutes to seconds; years to months; weeks to days *and problems involving money and measures***