



Mathematics

A progression by year group

Contents



- Introduction
- Number and Place Value
- Addition and Subtraction
- Multiplication and Division
- Fractions
- Ratio and proportion
- Algebra
- Measurement

Introduction (1)



- This is a cross-referenced mathematical progression, by year group (KS1 to Years 3-6 to KS3).
- Each year group's key mathematical skills are build upon those from the previous year group e.g. mathematical subjects are learnt, revised and the difficulty increased to show clear progression between our school's year groups. The knowledge should be cumulative, getting more complex each year without forgetting or ignoring what has gone before or what the children should be aspiring to in KS3.
- This should enable a better understanding of what knowledge is expected for your year group and, more importantly, what skills they require to consolidate, revise and extend their knowledge..
- This is a reference document rather than a prescriptive one. Class teachers should also look extend their more able children by referring to Testbase and the Maths Mastery documents (Oxford Owl). Broadening and deepening the knowledge in each year group is key.

Introduction (2)



- **Topics in mathematics can all be categorised by the following four topics:**
 - using and applying (problem solving),
 - number,
 - shape, space and measure
 - data handling.
- Each term, different aspects of these topics will be covered, ensuring that by the end of the year, children have covered all of the objectives required for their age and level.
- Below is a breakdown of what will be covered over the academic year by each year group. This will allow you to see what knowledge they should have practiced before and what we are aiming to move them on to the following year.

Number – Counting

KS1: Year 1 - Use the language of: equal to, more than, less than (fewer), most, least.

Year 2 - Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.



KS2:

Year 3	Year 4	Year 5	Year 6
	count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1000 000	
find 10 or 100 more or less than a given number	find 1 000 more or less than a given number		



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – Comparing

KS1: Year 1 - Use the language of: equal to, more than, less than (fewer), most, least.

Year 2 - Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.



KS2:

Year 3	Year 4	Year 5	Year 6
compare and order numbers up to 1 000	order and compare numbers beyond 1 000	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
	<i>compare numbers with the same number of decimal places up to two decimal places</i> (links to Fractions)	(appears also in Reading and Writing Numbers)	(appears also in Reading and Writing Numbers)



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – identifying, representing & estimating



KS1: Year 1 - count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
Year 2 - identify, represent and estimate numbers using different representations, including the number line



KS2:

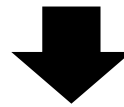
Year 3	Year 4	Year 5	Year 6
identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – identifying, representing & estimating

KS1: Year 1 - count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
Year 2 - identify, represent and estimate numbers using different representations, including the number line



KS2:

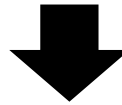
Year 3	Year 4	Year 5	Year 6
identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – reading & writing

KS1: Year 1 - read and write numbers from 1 to 20 in numerals and words.
Year 2 - read and write numbers to at least 100 in numerals and in words



KS2:

Year 3	Year 4	Year 5	Year 6



KS3:



Number – reading & writing

KS1: **Year 1** - read and write numbers from 1 to 20 in numerals and words.
Year 2 - read and write numbers to at least 100 in numerals and in words.



KS2:

Year 3	Year 4	Year 5	Year 6
read and write numbers up to 1 000 in numerals and in words	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
<i>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement)</i>		(appears also in Comparing Numbers) read Roman numerals to 1 000 (M) and recognise years written in Roman numerals.	(appears also in Understanding Place Value)



KS3: **Year 7** – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, alculating ratios and proportions, using calculator

Number – understanding place value

KS1: Year 1 –
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
		<p>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</p> <p>(appears also in Reading and Writing Numbers)</p> <p><i>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</i></p> <p>(copied from Fractions)</p>	<p>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</p> <p>(appears also in Reading and Writing Numbers)</p> <p><i>identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1 000 where the answers are up to three decimal places</i></p> <p>(copied from Fractions)</p>



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – rounding

KS1: Year 1 –
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
	round any number to the nearest 10, 100 or 1 000	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	round any whole number to a required degree of accuracy
	<i>round decimals with one decimal place to the nearest whole number</i> (copied from Fractions)	<i>round decimals with two decimal places to the nearest whole number and to one decimal place</i> (copied from Fractions)	<i>solve problems which require answers to be rounded to specified degrees of accuracy</i> (copied from Fractions)



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – problem solving

KS1: Year 1 –
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – addition & subtraction

mental calculation



KS1: Year 1 – add and subtract one-digit and two-digit numbers to 20, including zero

- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs

Year 2 – add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers and adding three one-digit numbers

- show that addition of two numbers can be done in any order and subtraction of one number from another cannot



KS2:

Year 3	Year 4	Year 5	Year 6
add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
			use their knowledge of the order of operations to carry out calculations involving the four operations



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – addition & subtraction

Written methods

KS1: Year 1 – read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

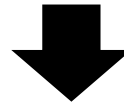
Number – addition & subtraction

inverse operations, estimating & checking



KS1: Year 1 –

Year 2 – recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.



KS2:

Year 3	Year 4	Year 5	Year 6
estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.




KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, alculating ratios and proportions, using calculator

Number – addition & subtraction problem solving


KS1: **Year 1** – solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$

Year 2 – solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures, applying their increasing knowledge of mental and written methods

KS2:



Year 3	Year 4	Year 5	Year 6
solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Solve problems involving addition, subtraction, multiplication and division



KS3: **Year 7** – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – multiplication & division facts

KS1: Year 1 – *count in multiples of twos, fives and tens* (copied from Number and Place Value)

Year 2 – *count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value) recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers



KS2:

Year 3	Year 4	Year 5	Year 6
<i>count from 0 in multiples of 4, 8, 50 and 100</i> (copied from Number and Place Value)	<i>count in multiples of 6, 7, 9, 25 and 1 000</i> (copied from Number and Place Value)	<i>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</i> (copied from Number and Place Value)	
recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	recall multiplication and division facts for multiplication tables up to 12×12		



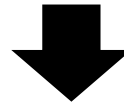
KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, alculating ratios and proportions, using calculator

Number – multiplication & division

mental calculation

KS1: Year 1 –

Year 2 – show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot



KS2:

Year 3	Year 4	Year 5	Year 6
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 (appears also in Written Methods)	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 and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
	recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</i> (copied from Fractions)

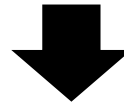


KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – multiplication & division written methods

KS1: Year 1 –

Year 2 – calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs



KS2:

Year 3	Year 4	Year 5	Year 6
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 (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	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	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – multiplication & division

multiples, factors, n^2 , prime, n^3

KS1: Year 1 –
Year 2 –

KS2:

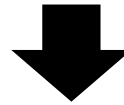
Year 3	Year 4	Year 5	Year 6
*	recognise and use factor pairs and commutativity in mental calculations (repeated)	<p>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</p> <p>know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</p> <p>establish whether a number up to 100 is prime and recall prime numbers up to 19</p> <p>recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</p>	<p>identify common factors, common multiples and prime numbers <i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</i> (copied from Fractions)</p> <p><i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3</i> (copied from Measures)</p>

KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – multiplication & division

order/inverse ops, estimating & checking

KS1: Year 1 –
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
<i>estimate the answer to a calculation and use inverse operations to check answers</i> (copied from Addition and Subtraction)	<i>estimate and use inverse operations to check answers to a calculation</i> (copied from Addition and Subtraction)		use their knowledge of the order of operations to carry out calculations involving the four operations
			use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy



KS3: Year 7 – decimals, ordering decimals, directed numbers, estimates, fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences, rounding, 4 operations, BODMAS, Long multiplication and division, calculating with measurements, ratio and proportion, calculating ratios and proportions, using calculator

Number – multiplication & division problem solving



KS1: Year 1 – solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Year 2 – solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

KS2:

Year 3	Year 4	Year 5	Year 6
solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	solve problems involving addition, subtraction, multiplication and division <i>solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)</i>
		solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	
		solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	

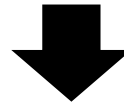
KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

counting in fractional steps

KS1: Year 1 –

Year 2 – Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (Non Statutory Guidance)



KS2:

Year 3	Year 4	Year 5	Year 6
count up and down in tenths	count up and down in hundredths		



KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

recognising fractions

KS1: Year 1 – recognise, find and name a half as one of two equal parts of an object, shape or quantity

- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity

Year 2 – recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity

KS2:

Year 3	Year 4	Year 5	Year 6
recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

comparing fractions

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

comparing decimals

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
*	compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places

KS3:

Fractions

rounding including decimals

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
*	round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions comparing decimals

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
*	compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

equivalence (fractions, decimals & %)



KS1: Year 1 –

Year 2 – write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

KS2:

Year 3	Year 4	Year 5	Year 6
recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
	recognise and write decimal equivalents of any number of tenths or hundredths	read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
	recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
		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 as a decimal fraction	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

addition & subtraction

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions multiplications & division

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
*		multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) multiply one-digit numbers with up to two decimal places by whole numbers divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Fractions

multiplication & division of decimals

KS1: Year 1 –
Year 2 –

KS2:


Year 3	Year 4	Year 5	Year 6
*	find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths		<p>multiply one-digit numbers with up to two decimal places by whole numbers</p> <p>multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places</p> <p>identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places</p> <p>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</p> <p>use written division methods in cases where the answer has up to two decimal places</p>

KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.


Fractions problem solving

KS1: Year 1 –
Year 2 –

KS2:



Year 3	Year 4	Year 5	Year 6
solve problems that involve all of the above	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	solve problems involving numbers up to three decimal places	
	solve simple measure and money problems involving fractions and decimals to two decimal places.	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 those with a denominator of a multiple of 10 or 25.	



KS3: Year 7 – fractions, fractions and decimals, adding and subtracting fractions, adding and subtracting decimals, multiplying and dividing decimals, equivalences.

Ratio & Proportion

(links to multiplication, division & fractions)

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
			<p>solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>solve problems involving similar shapes where the scale factor is known or can be found</p> <p>solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>

KS3: Year 7 – ratio & proportion

Algebra equations

- KS1:** **Year 1** – solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and **missing number problems** such as $7 = \square - 9$ (copied from Addition and Subtraction)
 represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)
- Year 2** – recognise and use the inverse relationship between addition and subtraction and use this to check calculations and **missing number problems**. (copied from Addition and Subtraction)
 - recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)

KS2:

Year 3	Year 4	Year 5	Year 6
solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction)		use the properties of rectangles to deduce related facts and find missing lengths and angles (copied from Geometry: Properties of Shapes)	express missing number problems algebraically
solve problems, including missing number problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division)			find pairs of numbers that satisfy number sentences involving two unknowns enumerate all possibilities of combinations of two variables

KS3: **Year 7** - Sequences and rules, finding missing terms, finding the general term (nth term), functions and mappings, using letter symbols, algebraic terms and expressions, rules of algebra, simplifying expressions, formulae, equations, square numbers and square root, triangle numbers, from mappings to graphs, more about graphs, questions about graphs, square-and-circle problems, solving equations and graphs from the real world.

Algebra formulae

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
	<p><i>Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit.</i></p> <p><i>(Copied from NSG measurement)</i></p>		<p>use simple formulae</p> <hr/> <p><i>recognise when it is possible to use formulae for area and volume of shapes</i></p> <p><i>(copied from Measurement)</i></p>

KS3: Year 7 - Sequences and rules, finding missing terms, finding the general term (nth term), functions and mappings, using letter symbols, algebraic terms and expressions, rules of algebra, simplifying expressions, formulae, equations, square numbers and square root, triangle numbers, from mappings to graphs, more about graphs, questions about graphs, square-and-circle problems, solving equations and graphs from the real world.

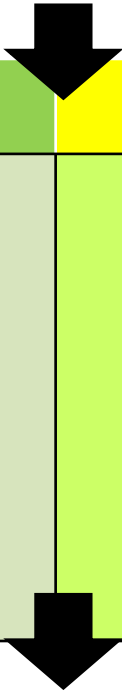
Algebra sequences

KS1: Year 1 – sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (copied from Measurement)

Year 2 – compare and sequence intervals of time (copied from Measurement)

- order and arrange combinations of mathematical objects in patterns (copied from Geometry: position and direction)

KS2:



Year 3	Year 4	Year 5	Year 6
			generate and describe linear number sequences

KS3: Year 7 - Sequences and rules, finding missing terms, finding the general term (nth term), functions and mappings, using letter symbols, algebraic terms and expressions, rules of algebra, simplifying expressions, formulae, equations, square numbers and square root, triangle numbers, from mappings to graphs, more about graphs, questions about graphs, square-and-circle problems, solving equations and graphs from the real world.

Measurement

comparing & estimating (1)

KS1: Year 1 – compare, describe and solve practical problems for: lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] mass/weight [e.g. heavy/light, heavier than, lighter than] capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] time [e.g. quicker, slower, earlier, later]

Year 2 – compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$

KS2:

Year 3	Year 4	Year 5	Year 6
	estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes (also included in measuring) estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water)	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3 .

KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Measurement

comparing & estimating (2)


KS1: Year 1 – sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]

Year 2 – compare and sequence intervals of time

KS2:



Year 3	Year 4	Year 5	Year 6
compare durations of events, for example to calculate the time taken by particular events or tasks			
estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)			



KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons


Measurement

measuring & calculating (1)


KS1: Year 1 – measure and begin to record the following: **lengths and heights, mass/weight, capacity and volume, time** (hours, minutes, seconds)

Year 2 – choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm); **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels

KS2:



Year 3	Year 4	Year 5	Year 6
measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	estimate, compare and calculate different measures , including money in pounds and pence (appears also in Comparing)	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	solve problems involving the calculation and conversion of units of measure , using decimal notation up to three decimal places where appropriate (appears also in Converting)
measure the perimeter of simple 2-D shapes	measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different perimeters and vice versa



KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Measurement

measuring & calculating (2)

KS1: Year 1 – recognise and know the value of different denominations of **coins and notes**


Year 2 – recognise and use symbols for pounds (**£**) and pence (**p**); combine amounts to make a particular value

- find different combinations of coins that equal the same amounts of money
- **solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change

KS2:



Year 3	Year 4	Year 5	Year 6
add and subtract amounts of money to give change, using both £ and p in practical contexts			



KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Measurement

measuring & calculating (3)

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
	find the area of rectilinear shapes by counting squares	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes <i>recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</i> (copied from Multiplication and Division)	calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm ³) and cubic metres (m ³), and extending to other units [e.g. mm ³ and km ³]. recognise when it is possible to use formulae for area and volume of shapes

KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Measurement telling the time

KS1: Year 1 – tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

- recognise and use language relating to dates, including days of the week, weeks, months and years

Year 2 – tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.

- know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)

KS2:

Year 3	Year 4	Year 5	Year 6
tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)		
estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)	solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	


KS3: Year 7 - N/A

Measurement converting


KS1: Year 1 –

Year 2 – know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)

KS2:



Year 3	Year 4	Year 5	Year 6
know the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
	solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres



KS3: Year 7 - N/A

Geometry - properties of shape

identifying shapes & their properties

- KS1:** **Year 1** – recognise and name common 2-D and 3-D shapes, including: 2-D shapes [e.g. rectangles (including squares), circles and triangles] & 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].
- Year 2** – identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
 - identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]

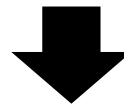
KS2:

Year 3	Year 4	Year 5	Year 6
	identify lines of symmetry in 2-D shapes presented in different orientations	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing) illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

KS3: **Year 7** - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Geometry - properties of shape drawing & constructing

KS1: Year 1 –
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	complete a simple symmetric figure with respect to a specific line of symmetry	draw given angles, and measure them in degrees ($^{\circ}$)	draw 2-D shapes using given dimensions and angles
			recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)

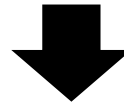


KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Geometry - properties of shape comparing & classifying

KS1: Year 1 –

Year 2 – compare and sort common 2-D and 3-D shapes and everyday objects



KS2:

Year 3	Year 4	Year 5	Year 6
	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles distinguish between regular and irregular polygons based on reasoning about equal sides and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons



KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Geometry - properties of shape angles

KS1: Year 1 –
Year 2 –

KS2:

Year 3	Year 4	Year 5	Year 6
recognise angles as a property of shape or a description of a turn		know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
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	identify acute and obtuse angles and compare and order angles up to two right angles by size	identify: <ul style="list-style-type: none"> * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and ½ a turn (total 180°) * other multiples of 90° 	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
identify horizontal and vertical lines and pairs of perpendicular and parallel lines			

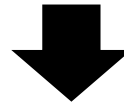
KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Geometry

position, direction & movement

KS1: Year 1 – describe position, direction and movement, including half, quarter and three-quarter turns.

Year 2 – use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)



KS2:

Year 3	Year 4	Year 5	Year 6
	describe positions on a 2-D grid as coordinates in the first quadrant	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 positions on the full coordinate grid (all four quadrants)
	describe movements between positions as translations of a given unit to the left/right and up/down		draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
	plot specified points and draw sides to complete a given polygon		

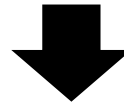


KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Geometry pattern

KS1: Year 1 –

Year 2 – order and arrange combinations of mathematical objects in patterns and sequences



KS2:

Year 3	Year 4	Year 5	Year 6



KS3: Year 7 - Length, perimeter and area, perimeter and area of rectangles, 3-D shapes, Surface area of cubes and cuboids, lines and angles, calculating angles, coordinates, measuring and drawing angles, constructions, solving geometrical problems, line symmetry, rotational symmetry, reflections, translation and polygons

Statistics

interpreting, constructing & presenting data

KS1: Year 1 –

- Year 2** – interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
 - ask and answer questions about totalling and comparing categorical data



KS2:

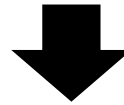
Year 3	Year 4	Year 5	Year 6
interpret and present data using bar charts, pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems



KS3: Year 7 - Mode, median and range, the mean, statistical diagrams, probability, experimental probability, using a tally chart, using the correct data, grouped, frequencies, data collection, pie charts, comparing data and statistical surveys

Statistics solving problems

KS1: Year 1 –
Year 2 –



KS2:

Year 3	Year 4	Year 5	Year 6
solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average



KS3: Year 7 - Mode, median and range, the mean, statistical diagrams, probability, experimental probability, using a tally chart, using the correct data, grouped, frequencies, data collection, pie charts, comparing data and statistical surveys