Year 1

Number: Place value

Key knowledge

To know numbers to 10 can represent 10 objects.

To know numbers to 10 can be placed on a number line.

To know a whole is made up of parts.

To know < means less than.

To know > means greater than.

To know = means equal to, the same as or equivalent.

To know numbers get bigger when you count forwards.

To know numbers get smaller when you count backwards.

To know 10 ones make 1 ten.

To know the position of a digit changes its value.

To know 10 tens make 1 hundred.

To know numbers to 100 can be shown on a 100 square.

To know numbers can be split into tens and ones.

Key skills

To be able to count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.

To be able to count, read and write numbers to 100 in numerals.

To be able to identify 1 more and 1 less from given a number.

To be able to identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.

To be able to read and write numbers from 1 to 20 in numerals and words.

Key vocabulary

100 square
backwards
compare
count
equal to
equivalent
equivalent
forwards
greater than
group
hundreds
less
less than
line
more
number
numbers
object
ones
order
ordinal
part
partition
represent
same as
sort
tens
whole

Number: Addition and subtraction

Key knowledge

To know + means add/plus/increase.

To know adding positive integers equals more.

To know two numbers can be added together to make 10.

To know − means subtract/take away.

To know subtracting number equals less.

To know two numbers can be added together to make 20.

Key skills

To be able to read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs.

To be able to represent and use number bonds and related subtraction facts within 20.

To be able to add and subtract one-digit and two-digit numbers to 20, including 0.

To be able to solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9.

Key vocabulary

add
addend
addition
difference
difference
fact families
minuend
minus
number bonds
plus
subtraction
subtrahend
sum
take away
together
total

Number: Multiplication and division

Key knowledge

To know there are patterns when counting in 2s, 5s and 10s which can help accuracy.

To know equal groups have the same number of objects.

To know unequal groups have a different number of objects.

To know an array represents groups in columns and in rows.

To know grouping involves making the same size groups.

To know sharing involves sharing equally between a set number of groups.

Key skills

To be able to count in multiples of 2s, 5s and 10s.

To be able to make equal groups.

To be able to add equal groups.

To be able to make arrays.

To be able to make doubles.

To be able to make equal groups from a quantity of objects or number (grouping).

To be able to share equally between a given number (sharing).

Key vocabulary

array
double
equal
group size
grouping
number of groups
sharing
unequal

Number: Fractions, decimals and percentages

Key knowledge

Key skills

Key vocabulary

Year 2

Number: Place value

Key knowledge

To know ten ones are called one ten.

To know a two-digit number is made up of tens and ones.

To know a number can be partitioned in many different ways – not just (for a two-digit number) into tens and ones.

To know < means less than.

To know > means greater than.

To know = means the same as, balanced, equal to or equivalent.

To know increasing means from smallest to largest.

To know decreasing means from largest to smallest.

Key skills

To be able to count in steps of 2,3,5 from 0, and in tens from any number, forward and backward.

To be able to recognise the place value of each digit in a two-digit number (10s, 1s).

To be able to identify, represent and estimate numbers using different representations, including the number line.

To be able to compare and order numbers from 0 up to 100; use <, > and = signs.

To be able to read and write numbers to at least 100 in numerals and in words.

To be able to use place value and number facts to solve problems.

Key vocabulary

digit
greater than
hundreds
less than
ones
order
partition
place value
tens
tens number
zero

Number: Addition and subtraction

Key knowledge

To know all number bonds to 20.

To know addition is bringing together two (or more) parts to make a whole (aggregation).

To know addition can also be increasing an amount (augmentation).

To know when I add any two odd numbers, the sum is always even.

To know when I add any two even numbers, the sum is always even.

To know when I add one odd and one even number, the total is odd.

To know a tens number has a zero in the ones column (e.g. 10, 20, 30, 40, 50).

To know when I add a tens number (10,20,30), the ones digit will not change.

To know subtraction is partitioning a whole into two or more parts (partitioning), decreasing the whole (reduction) or finding the difference between two parts (difference).

To know that when subtracting a tens number (10,20,30), the ones digit will not change.

Key skills

To be able to solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.

To be able to apply my increasing knowledge of mental and written methods.

To be able to recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.

To be able to add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1s; a two-digit number and 10s; 2 two-digit numbers; adding 3 one-digit numbers.

To be able to show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot.

To be able to recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Key vocabulary

add
addend
altogether
column addition
estimate
commutative
decrease
difference
difference between
expanded
expanded column
increase
leave
less
make
minuend
minus
more
number facts
plus
subtract
subtraction
subtrahend
sum
take away
total

Number: Multiplication and division

Key knowledge

To know doubling is adding the same number twice.

To know halving is splitting the whole into two equal parts.

To know one structure of multiplication is repeated addition (e.g. 3x4 is 4 + 4 + 4 or 3 +3 + 3 + 3).

To know multiplication is commutative – the position of the factors can change and the product stays the same.

To know one structure of division is grouping (quotative) where a whole (the dividend) is split into equal groups (the divisor) and the number of groups are found (quotient).

To know another structure of division is sharing (partitive) where the whole (the dividend) is shared equally between a given number of parts (the divisor) and the part size is found (quotient).

Key skills

To be able to recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.

To be able to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs.

To be able to show that multiplication of 2 numbers can be done in any order (commutative) and division of one number by another cannot.

To be able to solve problems involving multiplication and division using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Key vocabulary

commutative
divide
dividend
division
divisor
equal groups
equation
factor
grouping
groups
half
halving
lots of
multiplicand
multiplication
multiplier
part
product
quotient
repeated addition
sequence
sharing
time tables
whole

Number: Fractions, decimals and percentages

Key knowledge

To know fractions are a part of something.

To know fractions can be part of one thing or part of a group of things.

To know fractions are also numbers in their own right in our linear number system.

To know fractions can be written as one number on top of another. For example, a half is one over two ½.

To know writing fractions this way is called fraction notation.

To know a few fractions have special names:
½ is a half;
⅓ is a third;
¼ is a quarter;
⅕ is a fifth.

To know the top part of the fraction is called the numerator.

To know the bottom part of the fractions is called the denominator.

To know equivalent fractions are worth the same as each other even though they look different.

Key skills

To be able to recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity.

To be able to recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity.

To be able to recognise, find, name and write fractions one-third, one-quarter, two-quarters and three-quarters of a length, shape, set of objects or quantity.

To be able to write simple fractions, for example half of 6 = 3 and recognise the equivalence of two-quarters and one-half.

Key vocabulary

denominator
equal
equivalent
fraction
half
numerator
part
quarter
share
third
whole

Year 3

Number: Place value

Key knowledge

To know ten ones are called one ten.

To know ten tens are called one hundred.

To know ten hundreds are called one thousand.

To know the value of digits becomes ten times bigger as digits move to the left.

To know the value of digits becomes ten times smaller as digits move to the right.

To know the value of a digit relies on its place in the number.

To know 100 and 1,000 can be divided into two, four, five and ten equal parts and these units are used in graphing and measure contexts.

Key skills

To be able to count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.

To be able to recognise the place value of each digit in a 3-digit number (100s, 10s, 1s).

To be able to compare and order numbers up to 1,000.

To be able to identify, represent and estimate numbers using different representations.

To be able to read and write numbers up to 1,000 in numerals and in words.

To be able to solve number problems and practical problems involving these ideas.

Key vocabulary

compare
digit
greater than
hundreds
less than
numeral
ones
order
partition
place value
represent
solve
tens
tens number
zero

Number: Addition and subtraction

Key knowledge

To know addition is commutative; subtraction is not.

To know the language of addition: addend plus addend is equivalent to sum/total.

To know the whole can be found by adding the parts.

To know that when the whole and one of the parts is known, the other part can be worked out.

To know the language of subtraction: minuend subtract subtrahend is equivalent to difference.

To know that if 3 ones and 4 ones is 7 ones, then 3 tens plus 4 tens is 7 tens; 3 hundreds and 4 hundreds is 7 hundreds etc.

To know we exchange when subtracting using a vertical algorithm; one ten can be exchanged for ten ones; one one hundred can be exchanged for ten tens; one one thousand can be exchanged for ten one hundreds.

To know we regroup when adding using a vertical algorithm; fourteen ones can be regrouped as one ten and four ones.

To know when using a vertical algorithm for addition and subtraction that we start with the lowest value digit on the right.

Key skills

To be able to add and subtract numbers mentally, including: a three-digit number and 1s; a three-digit number and 10s; a three-digit number and 100s.

To be able to add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction.

To be able to estimate the answer to a calculation and use inverse operations to check answers.

To be able to solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Key vocabulary

add
addend
altogether
column
column addition
column subtraction
commutative
decrease
difference
difference between
digit
estimate
estimate
exchange
expanded
expanded column
increase
inverse operation
leave
less
make
minuend
minus
more
number facts
partition
plus
regroup
represent
subtract
subtraction
subtrahend
sum
take away
total

Number: Multiplication and division

Key knowledge

To know multiplication is the inverse of division.

To know multiplication is both commutative and associative. Division is not.

To know the commutative law states that the order of the numbers does not affect the result. a x b = b x a.

To know multiplication can be seen as repeated addition. 3 x 4 = 4 + 4 + 4 = 3 + 3 + 3 + 3.

To know division can be thought of as repeated subtraction. The number of times 5 can be taken away from 40 is 8.

To know one structure of division is grouping (quotative) where a whole (the dividend) is split into equal groups (the divisor) and the number of groups are found (quotient).

To know another structure of division is sharing (partitive) where the whole (the dividend) is shared equally between a given number of parts (the divisor) and the part size is found (quotient).

To know the language of multiplication: factor x factor = product
multiplicand x multiplier = product.

To know the language of division: dividend ÷ divisor = quotient.

Key skills

To be able to recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

To be able to write and calculate mathematical statements for multiplication and division using the multiplication tables that I know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.

To be able to 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.

Key vocabulary

array
commutative
divide
divide by
dividend
division
divisor
equal groups
equation
fact family
factor
grouping
groups
half
halving
lots of
multiplicand
multiplication
multiplier
multiply by
part
product
quotient
regrouping
repeated addition
sequence
sharing
time tables
whole

Number: Fractions, decimals and percentages

Key knowledge

To know ten tenths is equivalent to one whole.

To know when a whole is divided into equal parts each part is a fraction of the whole.

To know a fraction can be expressed as one number written above another e.g. ½.

To know the bottom part of the fraction is the denominator. This represents the total number of equal parts. The numerator is the top part of the fraction; this represents the number of parts being considered.

To know a unit fraction has a numerator of one.

To know that to add fractions with the same denominator, add the numerators together.

To know that to subtract a fraction with the same denominator, subtract the numerators.

To know comparing fractions with the same denominator can be achieved by ordering the numerators.

To know ordering unit fractions can be achieved by arranging them from the largest denominator to the smallest denominator.

Key skills

To be able to count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.

To be able to recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

To be able to recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.

To be able to recognise and show, using diagrams, equivalent fractions with small denominators.

To be able to add and subtract fractions with the same denominator within one whole (for example, 5/7 + 1/7 = 6/7).

To be able to compare and order unit fractions, and fractions with the same denominators.

To be able to solve problems that involve all of the above.

Key vocabulary

decimal tenths
denominator
eights
equal
equivalent
fifths
fraction
half
halves
non-unit fraction
numerator
part
quarter
share
sixths
tenths
thirds
unit fraction
whole

	Number: Place value		Number: Addition and subtraction		Number: Multiplication and division		Number: Fractions, decimals and percentages	
	Key knowledge	**Key skills**	**Key knowledge**	**Key skills**	**Key knowledge**	**Key skills**	**Key knowledge**	**Key skills**
Year 4	To know ten ones are called one ten. To know ten tens are called one hundred. To know ten hundreds are called one thousand. To know ten thousands are called one ten thousand. To know the value of digits becomes ten times bigger as digits move to the left. To know the value of digits becomes ten times smaller as digits move to the right. To know the value of a digit relies on its place in the number. To know negative numbers are below zero. To know negative numbers are less than zero. To know positive numbers are above zero. To know positive numbers are greater than zero. To know zero is neither positive or negative. To know when rounding to the nearest ten, the ones digit is the digit to consider. If it is four or less, we round down. If it is five or more we round up. To know when rounding to the nearest hundred, the tens digit is the digit to consider. If it is four or less, we round down. If it is five or more we round up. To know when rounding to the nearest thousand, the hundreds digit is the one to consider. If it is four or less, we round down. If it is five or more we round up. To know the value of Roman numerals to 100: I = 1; V = 5; X = 10; L = 50; C = 100. To know we can partition 4-digit numbers into thousands, hundreds, tens and ones. To know 100 and 1000 can be divided into two, four, five and ten equal parts and these units are used in graphing and measure contexts.	To be able to count in multiples of 3, 4, 6, 7, 8, 9, 25 and 1000. To be able to find 1000 more or less than a given number. To be able to count backwards through zero to include negative numbers. To be able to recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones). To be able to order and compare numbers beyond 1000. To be able to identify, represent and estimate numbers using different representations. To be able to round any number to the nearest 10, 100 or 1000. To be able to solve number and practical problems that involve all of the above and with increasingly large positive numbers. To be able to 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.	To know addition is commutative; subtraction is not. To know the language of addition: addend plus addend is equivalent to sum/total. To know the whole can be found by adding the parts. To know that when the whole and one of the parts is known, the other part can be worked out. To know the language of subtraction: minuend subtract subtrahend is equivalent to difference. To know that if 3 ones and 4 ones is 7 ones, then 3 tens plus 4 tens is 7 tens; 3 hundreds and 4 hundreds is 7 hundreds etc. To know we exchange when subtracting using a vertical algorithm; one ten can be exchanged for ten ones; one one hundred can be exchanged for ten tens; one one thousand can be exchanged for ten one hundreds. To know we regroup when adding using a vertical algorithm; fourteen ones can be regrouped as one ten and four ones. To know when using a vertical algorithm for addition and subtraction that we start with the lowest value digit on the right.	To be able to add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. To be able to estimate and use inverse operations to check answers to a calculation. To be able to solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	To know multiplication can be seen as repeated addition. To know division can be seen as repeated subtraction. To know a multiple of a number is the result of multiplying that number with a whole number. To know a factor of a number is any whole number that divides into it exactly. To know a product is the result of the multiplication of two or more numbers, quantities, etc. To know the multiplicand is a quantity which is to be multiplied by another (the multiplier). To know the divisor is a number that divides another number either completely or with a remainder. To know the language of multiplication: factor x factor = product multiplicand x multiplier = product. To know the language of division: dividend ÷ divisor = quotient.	To be able to recall multiplication and division facts for multiplication tables up to 12 × 12. To be able to use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers. To be able to recognise and use factor pairs and commutativity in mental calculations. To be able to multiply two-digit and three-digit numbers by a one-digit number using formal written layout. To be able to solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	To know when a whole is divided into equal parts each part is a fraction of the whole. To know a fraction can be expressed as one number written above another. To know the bottom part of the fraction is the denominator. This represents the total number of equal parts. To know the numerator is the top part of the fraction; this represents the number of parts being considered. To know equivalent fractions refer to the same proportion of the whole but are written in different ways. To know a unit fraction has a numerator of one. To know a proper fraction is less than one whole and has a numerator that is lower than the denominator. To know an improper faction is more than a whole unit; the numerator is higher than the denominator. To know a decimal is made of whole numbers and parts of whole numbers, separated by a dot called a decimal point. To know ten tenths is equivalent to one whole. To know ten one hundredths is equivalent to one tenth. To know one hundred hundredths is equivalent to one whole.	To be able to recognise and show, using diagrams, families of common equivalent fractions. To be able to count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. To be able to 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. To be able to add and subtract fractions with the same denominator. To be able to recognise and write decimal equivalents of any number of tenths or hundredths. To be able to recognise and write decimal equivalents to ¼, ½, ¾. To be able to 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 units, tenths and hundredths. To be able to round decimals with one decimal place to the nearest whole number. To be able to compare numbers with the same number of decimal places up to two decimal places. To be able to solve simple measure and money problems involving fractions and decimals to two decimal places.

	Key vocabulary compare digit greater than hundreds less than negative number numeral ones order partition place place value represent Roman numeral round rounded to solve tens value zero	**Key vocabulary** add addend altogether column column addition column subtraction commutative decrease difference difference between digit estimate exchange expanded expanded column increase inverse operation less make minuend minus more number number facts partition plus regroup represent solve problems subtract subtraction subtrahend sum take away total	**Key vocabulary** array commutative divide divide by dividend division divisor equal groups equation fact family factor grouping groups groups of half halving lots of multiple multiplicand multiplication multiplier multiply multiply by part product quotient regrouping remainder repeated addition sequence share time tables times whole	**Key vocabulary** decimal equivalents decimal hundredths decimal point decimal tenths denominator eighths elevenths equal equivalent fifths fraction half halves hundredths ninths non-unit fraction numerator part part-whole model place value quantities quarters rounding sevenths share sixths tenths thirds twelfths unit fraction whole

Year 5

Number: Place value		Number: Addition and subtraction		Number: Multiplication and division		Number: Fractions, decimals and percentages	
Key knowledge	**Key skills**	**Key knowledge**	**Key skills**	**Key knowledge**	**Key skills**	**Key knowledge**	**Key skills**
To know ten ones are called one ten. To know ten tens are called one hundred. To know ten hundreds are called one thousand. To know ten thousands are called one ten thousand. To know ten ten thousands are called one hundred thousand. To know ten one hundred thousands are called one million. To know ten to the power of one is 10. To know ten to the power of two is 100. To know ten to the power of three is 1000. To know ten to the power of four is 10,000. To know ten to the power of five is 100,000. To know ten to the power of six is one million. To know the value of digits becomes ten times bigger as digits move to the left. To know the value of digits become ten times smaller as digits move to the right. To know the value of a digit relies on its place in the number. To know negative numbers are below zero. To know negative numbers are less than zero. To know positive numbers are above zero. To know positive numbers are greater than zero. To know zero is neither positive or negative. To know for both positive and negative numbers, the larger the value of the number, the further it is from zero. To know when rounding to the	To be able to read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. To be able to count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000. To be able to interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers. To be able to round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000. To be able to solve number problems and practical problems that involve all of the above. To be able to read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.	To know addition is commutative; subtraction is not. To know the language of addition: addend plus addend is equivalent to sum/total. To know the whole can be found by adding the parts. To know that when the whole and one of the parts is known, the other part can be worked out. To know the language of subtraction: minuend subtract subtrahend is equivalent to difference. To know that if 3 ones and 4 ones is 7 ones, then 3 tens plus 4 tens is 7 tens; 3 hundreds and 4 hundreds is 7 hundreds etc.	To be able to add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). To be able to add and subtract numbers mentally with increasingly large numbers. To be able to use rounding to check answers to calculations. To be able to solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	To know a multiple of a number is the result of multiplying that number with a whole number. To know a common multiple is a number that is a multiple of two or more other numbers. To know the lowest common multiple of two or more numbers is the smallest number that is a multiple of each. To know a factor of a number is any whole number that divides into it exactly. While prime numbers only have two factors (1 and itself), other numbers can have many factors. To know any whole number can be written as a product of its factors: factor x factor = product. To know a common factor is a number that divides exactly into two or more other numbers. To know the highest common factor of two or more numbers is the largest number that is a factor of each. To know a prime factor is a factor which is also a prime number. To know a prime number can only be divided by 1 and itself. The first ten prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29. To know a composite number is any number which is not a prime number. To know a square number is the result of multiplying a whole number by itself. This is called squaring the number. E.g. 4 x 4 = 16. To know a cube number is the result of multiplying a whole number by itself then multiplying by itself again. This is called cubing the number. E.g. 4 x 4 x 4 = 64. To know multiplication is the inverse of division. Multiplication is both commutative and associative. Division is not. To know the commutative law states that the order of the numbers does not affect the result (a x b = b x a). To know the associative law states that the grouping of numbers does not affect the result. (a x b) x c = a x (b x c).	To be able to identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. To be able to use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. To be able to establish whether a number up to 100 is prime and recall prime numbers up to 19. To be able to recognise and use square numbers and cube numbers. To be able to solve problems involving multiplication and division including using my knowledge of factors and multiples, squares and cubes. To be able to 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. To be able to multiply and divide numbers mentally drawing upon known facts. To be able to divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. To be able to solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. To be able to solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	To know when a whole is divided into equal parts each part is a fraction of the whole. To know a fraction can be expressed as one number written above another ¾. The bottom part of the fraction is the denominator. This represents the total number of equal parts. The numerator is the top part of the fraction; this represents the number of parts being considered. To know equivalent fractions refer to the same proportion of the whole but are written in different ways. To know equivalent fractions can be calculated by multiplying or dividing the numerator and denominator by the same amount. To know when the numerator and denominator are divided by the same number, this is called cancelling or simplifying. To know one way to compare and order fractions is by expressing them with the lowest common denominator (the lowest multiple of both denominators). To know a unit fraction has a numerator of one. To know a proper fraction is less than one whole and has a numerator that is lower than the denominator. To know an improper fraction is more than a whole unit; the numerator is higher than the denominator. To know a mixed number consists of a whole number and a fraction; mixed numbers can also be expressed as improper fractions. To know that to add fractions, express each fraction in terms of the lowest common denominator and add the numerators together. To know to subtract a fraction, express each fraction in terms of the lowest common denominator and subtract the numerators. To know to multiply a fraction, multiply the numerators together and then multiply the denominators together. To know ten tenths is equivalent to one whole.	To be able to compare and order fractions whose denominators are all multiples of the same number. To be able to identify, name and write equivalent fractions of a given fraction. To be able to recognise mixed numbers and improper fractions and convert from one form to the other. To be able to add and subtract fractions with the same denominator and denominators that are multiples of the same number. To be able to multiply proper fractions and mixed numbers by whole numbers. To be able to read and write decimal numbers as fractions. To be able to recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. To be able to round decimals with two decimal places to the nearest whole number and to one decimal place. To be able to read, write, order and compare numbers with up to three decimal places. To be able to solve problems involving numbers up to three decimal places. To be able to multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000. To be able to recognise the percent symbol (%) and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with denominator of 100, and as a decimal. To be able to solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those fractions with a denominator of a multiple of 10 or 25.

	nearest ten, the ones digit is the digit to consider. If it is four or less, we round down. If it is five or more we round up. To know when rounding to the nearest hundred, the tens digit is the digit to consider. If it is four or less, we round down. If it is five or more we round up. To know when rounding to the nearest thousand, the hundreds digit is the one to consider. If it is four or less, we round down. If it is five or more we round up. To know when rounding to the nearest ten thousand, the thousands digit is the digit to consider. If it is four or less we round down; if it is five or more we round up. To know when rounding to the nearest one hundred thousand, the ten thousands digit is the digit to consider. If it is four or less, we round down, if it is five or more we round up. To know values of Roman numerals up to 1000: I = 1; V = 5, X = 10, L = 50; C = 100; D = 500; M = 1000. To know 10 000 and 100 000 can be divided into two, four, five and ten equal parts and these units are used in graphing and measure contexts.				To know multiplication can be seen as repeated addition. 3 x 4 = 4 + 4 + 4 = 3 + 3 + 3 + 3. I know that multiplication can also be seen as a scaling structure. a becomes four times the size 4a. To know long multiplication is a method of multiplying large numbers without a calculator and done in stages. To know division can be thought of as repeated subtraction. The number of times 5 can be taken away from 40 is 8. (grouping – quotative). I know division can also be equal sharing – sharing between a set number of groups. To know the language of multiplication: factor x factor = product. To know that multiplicand (group size) x multiplier (number of groups) equals product. To know that in division, the remainder is the amount left over when one number does not divide exactly into the other. Remainder can be abbreviated to rem or r. To know if a factor is made ten times bigger, the product is ten times bigger. To know if a factor is made ten times smaller, the product is ten times smaller.		To know ten one hundredths is equivalent to one tenth. To know one hundred hundredths is equivalent to one whole. To know ten thousandths is equivalent to one hundredth. To know one hundred thousandths is equivalent to one tenth. To know one thousand thousandths is equivalent to one. To know when a number is multiplied by ten, the digits move one place to the left. To know when a number is divided by ten, the digits move one place to the right. To know when a number is multiplied by one hundred the digits move two places to the left. To know when a number is divided by one hundred the digits move two places to the right. To know when a number is multiplied by one thousand the digits move three places to the left. To know when a number is divided by one thousand the digits move three places to the right. To know the % symbol is used to represent percentage. To know per cent means number of parts per hundred. To know a percentage is a way of expressing a fraction or decimal as parts of a hundred. To know percentages have fraction and decimal equivalents. 50% = 0.5 = ½ 25% = 0.25 = ¼ 75% = 0.75 = ¾ 10% = 0.1 = ⅒ 20% = 0.2 = ⅕ 1% = 0.01 = ⅟100	
	Key vocabulary ascending compare descending digit equivalent estimate greater than hundred thousands hundreds less than millions negative negative number partition place place value represent Roman numeral round rounded to solve ten thousands tens thousands value zero		**Key vocabulary** add addend altogether column column addition column subtraction commutative decimal decrease difference difference between digit equation inverse inverse operation less minuend minus more number number facts operation partition plus regroup represent		**Key vocabulary** array common factor common multiple commutative composite number cube number divide divide by dividend division divisor equal groups equation highest common factor lots of lowest common multiple multiple multiplicand multiplication multiplier multiply multiply by part prime number product quotient		**Key vocabulary** cancel decimal equivalents decimal hundredths decimal point decimal tenths denominator equal equivalent equivalent fraction fraction half halves hundredths non-unit fraction numerator part part-whole model percentage place value proper fraction proportion quantities rounding share simplify unit fraction	

	numeral ones order	equivalence equivalent estimate exchange expanded expanded column expression hundredth increase	solve problems subtract subtraction subtrahend sum take away tenth thousandths total	whole fact family factor grouping groups groups of half halving	regrouping remainder repeated addition sequence share square number time tables times	improper fraction lowest common denominator mixed number	whole

Year 6

Number: Place value Number: Algebra		Number: Addition and subtraction Number: Multiplication and division		Number: Fractions, Decimals and percentages Number: Ratio and proportion	
Key knowledge	**Key skills**	**Key knowledge**	**Key knowledge**	**Key knowledge**	**Key skills**
To know ten ones are called one ten. To know ten tens are called one hundred. To know ten hundreds are called one thousand. To know ten thousands are called one ten thousand. To know ten ten thousands are called one hundred thousand. To know ten one hundred thousands are called one million. To know ten one millions are called ten million. To know the value of digits becomes ten times bigger as digits move to the left. To know the value of digits become ten times smaller as digits move to the right. To know the value of a digit relies on its place in the number. To know negative numbers are below zero. To know negative numbers are less than zero. To know positive numbers are above zero. To know positive numbers are greater than zero. To know zero is neither positive or negative. To know for both positive and negative numbers, the larger the value of the number, the further it is from zero. To know when rounding to a given value, the immediate digit to the right is the one to consider. If it is four or less, we round down; if it is five or more we round up. To know 10,000 and 100,000 can be divided into two, four, five and ten equal parts and these units are used in graphing and measure contexts.	To be able to read, write, order and compare numbers up to 10 000 000 and determine the value of each digit. To be able to round any whole number to a required degree of accuracy. To be able to use negative numbers in context, and calculate intervals across zero. To be able to solve number and practical problems that involve all of the above.	To know addition is commutative; subtraction is not. To know the language of addition: addend plus addend is equivalent to sum/total. To know the whole can be found by adding the parts. To know when the whole and one of the parts is known, the other part can be worked out. To know the language of subtraction: minuend subtract subtrahend is equivalent to difference. To know multiplication is commutative, division is not. To know long multiplication and division are methods of multiplying and dividing large numbers without a calculator. To know the remainder is the amount left over when one number does not divide equally into another. This can sometimes be rounded up and sometimes rounded down, according to context. To know BIDMAS tells us the order in which operations should be carried out. To know estimating helps us to get a rough idea of a calculation. We round numbers in the calculation to make it easier. To know common multiple is a number that is a multiple of two or more other numbers. To know a common factor is a number that divides exactly into two or more other numbers. To know a prime number can only be divided by 1 and itself. The first ten prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29.	To be able to multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. To be able to divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. To be able to divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. To be able to perform mental calculations, including with mixed operations and large numbers. To be able to identify common factors, common multiples and prime numbers. To be able to use my knowledge of the order of operations to carry out calculations involving the four operations. To be able to solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. To be able to solve problems involving addition, subtraction, multiplication and division. To be able to use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	To know when a whole is divided into equal parts each part is a fraction of the whole. To know a fraction can be expressed as one number written above another ¾. The bottom part of the fraction is the denominator. This represents the total number of equal parts. The numerator is the top part of the fraction; this represents the number of part being considered. To know equivalent fractions refer to the same proportion of the whole but are written in different ways. To know equivalent fractions can be calculated by multiplying or dividing the numerator and denominator by the same amount. To know when the numerator and denominator are divided by the same number, this is called cancelling or simplifying. To know an easy way to compare and order fractions is by expressing them with the lowest common denominator (the lowest multiple of both denominators). To know a unit fraction has a numerator of one. To know a proper fraction is less than one whole and has a numerator that is lower than the denominator. To know an improper fraction is more than a whole unit; the numerator is higher than the denominator. To know a mixed number consists of a whole number and a fraction; mixed numbers can also be expressed as improper fractions. To know to add fractions, express each fraction in terms of the lowest common denominator and add the numerators together. To know to subtract a fraction, express each fraction in terms of the lowest common denominator and subtract the numerators. To know to multiply a fraction, multiply the numerators together and then multiply the denominators together. To know to divide a fraction by a whole number, you can change it to an equivalent multiplication. To divide by 5, we can multiply by one fifth. To know when dividing fractions by whole numbers, if the divisor is a factor of the numerator, simply divide the numerator by the divisor and leave the denominator the same. To know to find the whole when the fraction is known, find the size of each equal part and multiply by how many parts in total.	To be able to use common factors to simplify fractions. To be able to use common multiples to express fractions in the same denomination. To be able to compare and order fractions, including fractions > 1. To be able to add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. To be able to multiply simple pairs of proper fractions, writing the answer in its simplest form (for example, ¼ x ½ = ⅛). To be able to divide proper fractions by whole numbers (for example, ⅓ ÷ 2 = ⅙). To be able to associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example, ⅜). To be able to identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to three decimal places. To be able to multiply one-digit numbers with up to two decimal places by whole numbers. To be able to use written division methods in cases where the answer has up to two decimal places. To be able to solve problems which require answers to be rounded to specified degrees of accuracy. To be able to recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. To be able to solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. To be able to solve problems involving the calculation of percentages [for example, of

	Algebra To know a linear number sequence is where each value increases or decreases by the same amount. To know each number in a linear number sequence is called a term. To know the constant change between each number is called the term to term rule. This is found by finding the difference between each adjacent term. To know an expression is a group of numbers, letters and operation symbols. To know an equation is a number statement with an equal sign. Expressions on either side are equal. To know a formula is a special type of equation that shows the relationship between different variables. They are often used in geometry to find area and volume. To know in an equation with two unknown numbers, there may be several possible values for the unknowns that will balance the equation. To know enumerating means making a complete list of answers to a problem. To know that in algebra, missing numbers in equations are represented by letters. This is often written like as an x that looks like this: x .	**Algebra** I can use simple formulae. I can generate and describe linear number sequences. I can express missing number problems algebraically. I can find pairs of numbers that satisfy an equation with two unknowns. I can enumerate possibilities of combinations of two variables.			To know ten tenths is equivalent to one whole. To know one hundred hundredths is equivalent to one whole. To know one thousand thousandths is equivalent to one whole. To know when a number is multiplied by ten, the digits move one place to the left. To know when a number is divided by ten, the digits move one place to the right. To know when a number is multiplied by one hundred the digits move two places to the left. To know when a number is divided by one hundred the digits move two places to the right. To know when a number is multiplied by one thousand the digits move three places to the left. To know when a number is divided by one thousand the digits move three places to the right. To know any fraction can be converted to a decimal by dividing the numerator by the denominator. To know fractions can be converted to thousandths in order to convert to a decimal. To know if there is a decimal point in the number being multiplied, put a decimal point in the product. Line it up with the decimal point in the number being multiplied. To know in short division, if there is a decimal point in the dividend, put a decimal point in the quotient; line it up with the decimal point in the dividend. To know the % symbol is used to represent percentage. To know percent means number of parts per hundred A percentage is a way of expressing a fractions or decimal as parts of a hundred. To know percentages have fraction and decimal equivalents. To know 1%, 10% and 50% are helpful percentages to use when finding percentages of numbers. To know proportion compares a part of something with the whole thing. It is the same as finding a fraction of the whole amount. To know ratio compares one amount with another. To know that to simplify a ratio, I divide both sides by the same number to give an equivalent ratio that uses smaller numbers. To know that when you can't divide the numbers any more, the ratio is in its simplest form or lowest terms.	measures, and such as 15% of 360] and the use of percentages for comparison. To be able to solve problems involving similar shapes where the scale factor is known or can be found. To be able to solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

	Key vocabulary compare digit equation expression formula greater than hundred thousands hundreds hundredths less than list of possibilities (enumerate) millions negative number ones pairs of unknowns partition round rounded substitution ten millions ten thousands tens tenths thousands thousandths unknown variable	**Key vocabulary** add addend altogether commutative decrease difference divide dividend division divisor equivalence equivalent exchange expression equation increase inverse less long minuend minus more multiplicand multiplication multiplier multiply operation plus product quotient regroup remainder short subtract subtrahend sum total	**Key vocabulary** common denominator compare convert decimal equivalent decimal fraction decimal place denominator discount enlargement equal to equivalent equivalent decimal equivalent fraction factor for every…there are fraction highest/lowest common multiple hundredth improper fractions length mixed number numerator order part partitioning per cent (out of) percentage perimeter proper fractions proportion ratio recurring remainder rounding scale factor sharing similar shapes simplest form simplify tenth thousandth whole whole number width

Year 1

Measurement

Key knowledge

To know length and height can be measured with nonstandard and standard units.

To know a ruler can be used to measure height and length.

To know scales can be used to measure weight/mass.

To know a measuring jug can be used to measure capacity and volume.

To know coins have different values.

To know a clock can be used to measure time.

Key skills

To be able to compare, describe and solve practical problems for: lengths and heights; mass/weight; capacity and time.

To be able to measure and begin to record the following:
lengths and heights;
mass/weight;
capacity and volume;
time (hours, minutes, seconds).

To be able to recognise and know the value of different denominations of coins and notes.

To be able to sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening].

To be able to recognise and use language relating to dates, including days of the week, weeks, months and years.

To be able to tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

Key vocabulary (tier 2)

after
April
August
before
capacity /volume
centimetres
clock
clock hands
day
December
earlier
emptier
emptiest
empty
February
Friday
full
fuller
fullest
half hour
heavier
heaviest
heavy
height
hour
January
July
June
later
length
light
lighter
lightest
long
longer
longest
March
May
measuring cylinder
measuring jug
metres
minute
Monday
month
November
October
ruler
Saturday
scales
September
short
shorter
shortest
Sunday
tall
taller
tallest
Thursday
Tuesday
Wednesday
week
weight/mass
width
year

Geometry: Properties of shape

Key knowledge

To know a 3D shape can be picked up.

To know a 2D shape cannot be picked up.

To know the names of common two-dimensional shapes (circle, rectangle, square and triangle).

To know the names of common three-dimensional shapes (cube, cuboid, pyramid and sphere).

Key skills

To be able to recognise and name common 2D and 3D shapes, including: 2D shapes [for example, rectangles (including squares), circles and triangles]; 3D shapes [for example, cuboids (including cubes), pyramids and spheres].

Key vocabulary

2D
3D
circle
cone
cube
cuboid
cylinder
depth
dimension
height
hexagon
length
oblong
octagon
pentagon
pyramid
rectangle
sphere
square
triangle
width

Geometry: Position and direction

Key knowledge

To know what a full turn is.

To know what a half turn is.

To know what a quarter turn is.

To know what a three-quarter turn is.

Key skills

To be able to describe position, direction and movement including whole, half, quarter and three-quarter turns.

Key vocabulary

above
anti- clockwise
around
between
bottom
clockwise
close
direction
forwards and backwards
half
in front of
inside and outside
left
middle
near
on top of
position
quarter
right
three quarter
top
turn
whole

Statistics

Key knowledge

Key skills

Key vocabulary

Year 2

Measurement

Key knowledge

To know there are 60 seconds in a minute, 60 minutes in an hour, 24 hours in a day, 365 days in a (non-leap) year and 12 months in a year.

To know time can be measured using a clock, watch, calendar and in other ways.

To know the left-hand side of the clock shows 'to' times (e.g. five to 6) and the right-hand side shows past times (e.g. ten past 5).

To know the long hand is the minute hand.

To know the shorter hand is the hour hand.

To know grams (g) are a unit of measure.

To know there are 1,000g in a kilogram (kg).

To know we use g to measure lighter objects and kg to measure heavier objects.

To know different things/objects can be used to measure length.

To know centimetres (cm) are a unit of measure.

To know there are 100 cm in a metre (m).

To know we use cm to measure smaller objects and m to measure bigger objects.

To know money is measured in pounds (£) and pence (p). There is 100p in £1.

To know capacity is the measure of how much an object can hold.

To know volume is the measure of how much liquid there is.

To know capacity is measured in millilitres (ml) and litres (l).

To know there are 1000 ml in a litre.

To know millilitres are used for measuring smaller amounts of liquid.

To know litres are used for measuring larger amounts of liquid.

To know temperature is measured in degrees.

Key skills

To be able to 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.

To be able to compare and order lengths, mass, volume/capacity and record the results using >, < and =.

To be able to recognise and use symbols for pounds (£) and pence (p).

To be able to combine amounts to make a particular value.

To be able to find different combinations of coins that equal the same amounts of money.

To be able to solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.

To be able to compare and sequence intervals of time.

To be able to 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.

Key vocabulary

capacity
change (money)
degrees
five-past
five-to
gram
minute
month
pence
pound
quarter-past
quarter-to

Geometry: Properties of shape

Key knowledge

To know a 2D shape has height and width; it is completely flat and you cannot pick it up.

To know an object that has height, width and depth, like any object in the real world is a 3D shape.

To know a line of symmetry is a line that cuts a shape exactly in half.

Key skills

To be able to identify and describe the properties of 2D shapes, including the number of sides, and line symmetry in a vertical line.

To be able to identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.

To be able to identify 2D shapes on the surface of 3D shapes, [for example, a circle on a cylinder and a triangle on a pyramid].

To be able to compare and sort common 2D and 3D shapes and everyday objects.

Key vocabulary

cone
corner
apex
cube
cuboid
curved
side
solid
square based pyramid
straight
three-dimensional
triangular based pyramid

Geometry: Position and direction

Key knowledge

To know to turn to our left for anti-clockwise.

To know to turn to our right for clockwise.

To know there are two half turns in a full turn.

To know there are four quarter turns in a full turn.

To know a quarter turn is the same as a right angle.

Key skills

To be able to 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).

To be able to order and arrange combinations of mathematical objects in patterns and sequences.

Key vocabulary

anti-clockwise
backwards
clockwise
East
forwards
half
pattern
quarter
right
sequence
South
three-quarter turn

Statistics

Key knowledge

To know pictograms, bar charts and tally charts can be used to show how many of something there is.

Key skills

To be able to interpret and construct simple pictograms, tally charts, block diagrams and tables.

To be able to ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.

To be able to ask and answer questions about totalling and comparing categorical data.

Key vocabulary

block diagram
compare
data
interpret
key
pictogram
symbol
table
tally chart
total

	half-past heavier hour kilogram lighter litre mass millilitre	second temperature ten-past ten-to twenty-five-to twenty-past twenty-to volume	cylinder edge face flat line of symmetry pattern round	triangular prism two-dimensional vertex vertical	left North	West	

Year 3

Measurement

Key knowledge

To know:
1 cm = 10 mm
1 m = 100 cm
1 litre = 1000 millilitres
1 kilogram = 1000 grams.

To know the distance around the edge of a shape is its perimeter.

To know a day is the amount of time it takes the Earth to spin once on its axis. This period is divided into 24 hours which can be broken down into smaller units: minutes and seconds. These are the units used in telling the time.

To know there are 60 minutes in one hour.

To know there are 60 seconds in one minute.

To know the 12-hour clock is a time system in which the hours in a day are broken down into two groups of 12 hours.

To know the 24-hour clock is a time system in which the 24 hours of the day are not expressed as am and pm but are numbered straight through from 0 – 23.

To know roman numerals can be used on a 12 hour clock I= 1; V=5, X = 10.

Key skills

To be able to measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

To be able to measure the perimeter of simple 2D shapes.

To be able to add and subtract amounts of money to give change, using both £ and p in practical contexts.

To be able to tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.

To be able to estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight.

To be able to talk about the number of seconds in a minute and the number of days in each month, year and leap year.

To be able to compare durations of events (for example, to calculate the time taken by particular events or tasks).

Key vocabulary

24-hour clock
amount
analogue
capacity
change
coin
combinations
convert
gram
gram
heavier
kilogram
lighter
litre
mass
millilitre
pence
penny
perimeter
pounds
Roman numerals
value
volume

Geometry: Properties of shape

Key knowledge

To know an angle is formed whenever two lines meet at a point. The angle is measured by the amount of turn that one line must travel about this point to arrive at the position of the other line.

To know angles are measured in degrees.

To know there are several types of angles, classified by their size.

To know a whole turn (full turn or complete turn) is equal to 360°.

To know a right angle is a quarter of a full turn and equal to 90°. Lines that meet at a right angle are described as perpendicular.

To know a straight angle is half a full turn and equal to 180°.

To know parallel lines are always the same distance apart and they will never meet.

Key skills

To be able to draw 2D shapes and make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them.

To be able to recognise angles as a property of shape or a description of a turn.

To be able to identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle.

To be able to identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Key vocabulary

acute
angle
apex
curved
degrees
edge
flat face
half turn
horizontal
obtuse
parallel
perpendicular
point
polygon
properties
quarter turn
right angle
surface
three-dimensional
three-quarter turn
two-dimensional
vertex
vertical
vertices

Geometry: Position and direction

Key knowledge

Key skills

Key vocabulary

Statistics

Key knowledge

To know information can be recorded in a tally chart or table and presented in a graph.

To know presenting data in a graph makes the data easier to interpret.

To know a bar chart uses vertical or horizontal bars of equal width to show frequency of a distribution.

To know a pictogram is a chart on which pictures show the frequency of a distribution. A pictogram includes a title and a key, explaining what the pictures mean.

Key skills

To be able to interpret and present data using bar charts, pictograms and tables.

To be able to 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.

Key vocabulary

axes
bar chart
data
frequency
horizontal axis
interpret
intervals
pictogram
scale
symbol
table
tally
vertical axis

Year 4

Measurement

Key knowledge

To know key equivalent measures:
1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 week = 7 days
1 year = 12 months or 52 weeks or 365 days
1 leap year = 366 days
1 decade = 100 days
1 century = 100 years
1 millennium = 1000 years

£1 = 100 p
£5 = 500 p
£20 = 2000 p
£50 = 5000 p

1 cm = 10 mm
1 m = 100 cm
1 km = 1000 m

1 litre = 1000 millilitres
1 kilogram = 1000 grames

To know the distance around the edge of a shape is its perimeter.

To know that to find the perimeter of a polygon, add together the lengths of all the sides.

To know that the area of a 2D shape is the space within its perimeter.

Key skills

To be able to convert between different units of measure (for example, kilometre to metre; hour to minute).

To be able to measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.

To be able to find the area of rectilinear shapes by counting squares.

To be able to estimate, compare and calculate different measures, including money in pounds and pence.

To be able to read, write and convert time between analogue and digital 12- and 24-hour clocks.

To be able to solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days.

Geometry: Properties of shape

Key knowledge

To know a polygon is a shape formed from three or more points joined by three or more straight lines. The points are known as vertices (each point is a vertex) and the lines are called sides.

To know a regular polygon has equal sides and equal interior angles. An irregular polygon does not.

To know a shape has symmetry if you can halve it or turn it so that it fits exactly onto itself.

To know a quadrilateral is a four-sided polygon, having four edges and four corners.

To know some quadrilaterals have special names.

To know, in a parallelogram, sides that are opposite each other are equal and parallel; the angles opposite each other are equal.

To know a rectangle has two pairs of equal sides and four right angles. Rectangles are sometimes called oblongs.

To know a square is a special type of rectangle that has four equal sides and four right angles.

To know, in a rhombus, sides that are opposite each other are parallel. All sides are the same length and opposite angles are equal.

To know a trapezium has only one pair of parallel sides.

To know a kite has two pairs of equal adjacent sides. One pair of opposite angles is also equal.

To know there are different types of triangles. All triangles are polygons with three sides and three angles.

To know an equilateral triangle has three equal angles and three equal sides.

To know an isosceles triangle has two equal angles and two equal sides.

To know a scalene triangle has no equal sides and no equal angles.

To know an angle is formed whenever two lines meet at a point. The angle is measured by the amount of turn that one line must travel about this point to arrive at the position of the other line.

To know angles are measured in degrees.

To know there are several types of angles, classified by their size.

Key skills

To be able to compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

To be able to identify acute and obtuse angles and compare and order angles up to 2 right angles by size.

To be able to identify lines of symmetry in 2D shapes presented in different orientations.

To be able to complete a simple symmetric figure with respect to a specific line of symmetry.

Geometry: Position and direction

Key knowledge

To know a translation is where an object is moved to a new position without being turned or reflected. The translated image is the same size and shape as the original object.

To know on a single quadrant grid, when reading right and up from the origin, the coordinates are positive numbers.

Key skills

To be able to describe positions on a 2D grid as coordinates in the first quadrant.

To be able to describe movements between positions as translations of a given unit to the left/right and up/down.

To be able to plot specified points and draw sides to complete a given polygon.

Statistics

Key knowledge

To know how to record information in a tally chart or table and present it in a graph.

To know that presenting data in a graph makes the data easier to interpret.

To know a bar chart uses vertical or horizontal bars of equal width to show frequency of a distribution.

To know a pictogram is a chart on which pictures show the frequency of a distribution. A pictogram includes a title and a key, explaining what the pictures mean.

To know a distance-time graph shows how far an object has travelled in a given time.

Key skills

To be able to interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.

To be able to solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

			To know a right angle is a quarter of a full turn and equal to 90°. Lines that meet at a right angle are described as perpendicular. To know a straight angle is half a full turn and equal to 180°. To know an acute angle is any angle smaller than a right angle. To know an obtuse angle is an angle greater than a right angle but smaller than a straight angle.					
	Key vocabulary 12-hour time 24-hour am analogue area centimetres digital distance half past hours kilometres length metres midday midnight millimetres minutes noon o'clock pence perimeter pm pounds quarter past quarter to rectilinear Roman numerals seconds squares width		**Key vocabulary** acute angle diagonal equilateral horizontal isosceles kite line of symmetry mirror line oblong obtuse parallel parallelogram perpendicular polygon quadrilateral rectangle reflection rhombus right angle scalene square trapezium two-dimensional vertical		**Key vocabulary** coordinate quadrant reflection translation vertex vertices X-axis Y-axis		**Key vocabulary** bar chart comparison continuous data difference discrete data frequency table interpret pictogram sum time graph	

Year 5

Measurement

Key knowledge

To know:
1 cm = 10 mm
1 m = 100 cm
1 km = 1000 m
1 litre = 1000 millilitres
1 kilogram = 1000 grams

To know the distance around the edge of a shape is its perimeter.

To know the amount of space occupied by a 2D shape is its area.

To know to find the perimeter of a polygon, add together the lengths of all the sides.

To know to find the area of a rectangle, multiply the length by the width.

To know the amount of solid occupied by a 3D shape is called its volume. This space can be measured by the number of unit cubes that can fit inside it. Common units for measuring volume are cubic centimetres (cm^3) and cubic metres (m^3).

To know the volume of a cuboid is calculated using volume = length x width x height.

To know the volume of an object is closely related to its capacity – that is the amount it can contain. I know capacity is measured in litres (l) and millilitres (ml).

To know a day is the amount of time it takes the Earth to spin once on its axis. This period is divided into 24 hours which can be broken down into smaller units: minutes and seconds. These are the units used in telling the time.

To know there are 60 minutes in one hour.

I know there are 60 seconds in one minute.

To know the 12-hour clock is a time system in which the hours in a day are broken down into two groups of 12 hours.

To know 24-hour clock is a time system in which the 24 hours of the day are not expressed as am and pm but are numbered straight through from 0 – 23.

To know:
1 inch ≈ 2.5 cm
1 foot ≈ 30 cm
5 miles ≈ 8 km
2.2 pounds ≈ I kg
1.75 pints ≈ 1 litre

Key skills

To be able to convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).

To be able to understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.

To be able to measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.

To be able to calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes.

To be able to estimate volume and capacity.

Geometry: Properties of shape

Key knowledge

To know angles are measured in degrees.

To know there are several types of angles, classified by their size.

To know a whole turn (full turn or complete turn) is equal to 360°.

To know a right angle is a quarter of a full turn and equal to 90°. Lines that meet at a right angle are described as perpendicular.

To know a straight angle is half a full turn and equal to 180°.

To know an acute angle is any angle smaller than a right angle.

To know an obtuse angle is an angle greater than a right angle but smaller than a straight angle.

To know a reflex angle is any angle greater than 180°.

To know angles at a point are formed when any number of lines meet at a point. These angles add up to 360°.

To know vertically opposite angles are on opposite sides of the point where two lines cross. These pairs of angles are always equal.

To know a rectangle is a quadrilateral in which opposite sides are equal and parallel. All interior angles are right angles. The diagonals of a rectangle are equal in length.

To know a polygon is a shape formed from three or more points joined by three or more straight lines. The points are known as vertices (each point is a vertex) and the lines are called sides.

To know a regular polygon has equal sides and equal interior angles. An irregular polygon does not.

Key skills

To be able to estimate and compare acute, obtuse and reflex angles.

To be able to draw given angles, and measure them in degrees (°).

To be able to identify: angles at a point and one whole turn (total 360°); angles at a point on a straight line and other multiples of 90.

To be able to use the properties of rectangles to deduce related facts and find missing lengths and angles.

To be able to distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

To be able to identify, describe and represent the position of a shape following a reflection or translation.

To be able to identify 3D shapes including cubes and other cuboids from 2D representations.

Geometry: Position and direction

Key knowledge

To know a translation is where an object is moved to a new position without being turned or reflected. The translated image is the same size and shape as the original object.

To know a reflection is where each point is mapped to a corresponding point. These are an equal distance and at right angles to a mirror line. The size and angles of the reflected image stay the same as the original object; its sense has changed in that the image is back to front.

Key skills

To be able to identify, describe and represent the position of a shape following a reflection or translation.

Statistics

Key knowledge

To know a line graph is a graph where points are plotted and joined by a series of straight lines. The title tells you what the line graph shows. The labels on the axes explain what they represent and give the units that are used (as appropriate).

Key skills

To be able to solve comparison, sum and difference problems using information presented in a line graph.

To be able to complete, read and interpret information in tables, including timetables.

	Key vocabulary		**Key vocabulary**		**Key vocabulary**		**Key vocabulary**	
	12-hour clock	metre (m)	acute angle	quarter turn	coordinates		bar chart	interpret
	24-hour clock	metric	angle	reflex angle	origin		comparison	line graph
	area	mile	degrees	right angle	reflection		continuous data	pictogram
	capacity	millilitre (ml)	diagonal	side	translation		difference	sum
	centimetre (cm)	millimetre (mm)	full turn	straight angle	X-axis		discrete data	tally chart
	day	minute	obtuse angle	vertex	Y-axis		frequency table	
	foot	perimeter	parallel	vertices				
	hour	pint	perpendicular					
	imperial	pounds						
	inch	second						
	kilometre (km)	volume						
	litre (l)							

Year 6

Measurement		Geometry: Properties of shape		Geometry: Position and direction		Statistics	
Key knowledge To know metric and imperial measurements are used in different places throughout the world.  1 mile ≈ 1.6 km 5 miles ≈ 8 km 1 inch ≈ 2.5 cm 2.2 pounds ≈ 1 kg 1 gallon ≈ 4.5 litres To know perimeter is a measurement of distance. Area is a measurement of space. To know the area of a rectangle = length x width. To know the perimeter of a rectangle = (length + width) x 2. To know area of a triangle = base x perpendicular height ÷ 2. To know shapes with the same area can have different perimeters and vice versa. To know the area of a parallelogram = base x perpendicular height. To know volume can be calculated by counting cubes or by multiplying the length by the width by the height. To know area is measured in the unit squared. To know volume is measured in the unit cubed.	**Key skills** To be able to solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. To be able to 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 up to three decimal places. To be able to convert between miles and kilometres. To be able to recognise that shapes with the same areas can have different perimeters and vice versa. To be able to recognise when it is possible to use formulae for area and volume of shapes. To be able to calculate the area of parallelograms and triangles. To be able to 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 (for example, mm^3, and km^3).	**Key knowledge** To know there are several types of angles, classified by their size. To know a whole turn (full turn or complete turn) is equal to 360°. To know a right angle is a quarter of a full turn and equal to 90°. Lines that meet at a right angle are described as perpendicular. To know a straight angle is half a full turn and equal to 180°. To know an acute angle is any angle smaller than a right angle. To know an obtuse angle is an angle greater than a right angle but smaller than a straight angle. To know a reflex angle is any angle greater than a straight angle. To know angles at a point are formed when any number of lines meet at a point. These angles add up to 360°. To know vertically opposite angles are on opposite sides of the point where two lines cross. These pairs of angles are always equal. To know angles in a triangle add up to 180 degrees. To know angles in a quadrilateral add up to 360 degrees. To know you can calculate the sum of the interior angles of a polygon by subtracting 2 from the number of sides and multiplying this by 180. To know a circle is a 2D shape. The perimeter of a circle is called the circumference. The distance across the middle is the diameter. The distance from the centre to the circumference is the radius. The radius is half the diameter. To know a net is what a 3D shape would look like if it was unfolded. To know a 3D shape has three dimensions – length, width and depth. A polyhedron is a 3D shape with flat faces. Spheres, cylinders and cones are not polyhedrons because they have curved surfaces. To know a protractor is used to measure angles and help us construct 2D shapes.	**Key skills** To be able to draw 2D shapes using given dimensions and angles. To be able to recognise, describe and build simple 3D shapes, including making nets. To be able to compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. To be able to Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. To be able to recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.	**Key knowledge** To know on a four quadrant grid, when reading right and up from the origin, the coordinates are positive numbers; when reading left and down from the origin, the coordinates are negative. To know a translation is where an object is moved to a new position without being turned or reflected. The translated image is the same size and shape as the original object. To know a reflection is where each point is mapped to a corresponding point. These are an equal distance and at right angles to a mirror line. The size and angles of the reflected image stay the same as the original object; its sense has changed in that the image is back to front.	**Key skills** To be able to describe positions on the full coordinate grid (all four quadrants). To be able to draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	**Key knowledge** To know a line graph is a graph where points are plotted and joined by a series of straight lines. The title tells you what the line graph shows. The labels on the axes explain what they represent and give the units that are used (as appropriate). To know pie charts represent discrete data. A circle is divided into segments, where each segment represents a data category. The size of each segment represents its proportion of the total unit. To know the mean is the average set of data. To find the mean (or average), add up all the values to find the total. Divide the total by the number of values that you added together. This will give you the mean.	**Key skills** To be able to interpret and construct pie charts and line graphs and use these to solve problems. To be able to calculate and interpret the mean as an average.

	Key vocabulary area capacity centimetre cubic units foot gallon gram inch kilogram kilometre length litre mass millilitre millimetre ounce perimeter pint pound rectilinear stone volume volume width	**Key vocabulary** acute angle circumference diameter edge apex equilateral faces horizontal irregular isosceles obtuse parallel parallelogram perpendicular polygon protractor radius reflex regular right-angle right-angled scalene three-dimensional trapezium two-dimensional vertex vertical vertices	**Key vocabulary** axes co-ordinate quadrant reflect rotate translate	**Key vocabulary** bar chart comparison continuous data difference discrete data frequency table interpret line graph mean average median mode pictogram pie chart sum tally chart