



# Curriculum Guidance Mathematics

Long term planning guidance by year group.

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## Mathematics Learning Objectives

### Mathematics

- 1 To know and use numbers
- 2 To add and subtract
- 3 To multiply and divide
- 4 To know and use geometric facts
- 5 To represent geometric constructions
- 6 To use measures
- 7 To handle data
- 8 To understand and use ratio
- 9 To reason with maths
- 10 To use and apply mathematics

## Year 1

### Arithmetic

Autumn	Spring	Summer
<p>Calculate and record addition and subtraction maths stories to 20</p> <p>Add and subtract <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math></p> <p>Use facts to 10 to Create addition and subtraction maths stories about 0, 00 and 000</p>	<p>Copy and solve vertical addition and subtraction (up to 3 digit numbers)</p>	<p>Copy and solve vertical addition and subtraction (up to 4 digit numbers)</p>
Additional National Curriculum guidance:		
<p>Add and subtract one and two-digit numbers to 20</p> <p>Use known facts to 10 to calculate to 20</p>	<p>Read and write numbers to 100</p>	

### Geometry

Autumn	Spring	Summer
<p>Draw lines and shapes with a ruler</p> <p>Make 2D shapes using dm sticks and find the perimeter</p> <p>Measure the length of lines in cm</p>	<p>Make whole, half, quarter and three quarter turns</p> <p>Name 2D shapes: square, rectangle, triangle and circle</p>	<p>Recognise and compare 1D, 2D and 3D shapes</p> <p>Name 3D shapes: cuboid, cube, pyramid and sphere</p> <p>Identify 2D faces on 3D shapes</p>
Additional National Curriculum guidance:		
<p>Use positional language: top/middle/bottom left/right</p>	<p>Use positional vocabulary: left/right, top/middle/bottom, close/far, inside/outside, between/above</p>	<p>Recognise shapes in different orientations and sizes</p>

### Data and Measures

Autumn	Spring	Summer
<p>Measure the length of shapes using dm</p> <p>Find the perimeter of shapes using dm</p> <p>Use actions: 1cm/1dm/1m and 1g/1kg</p>	<p>Measure and record length</p> <p>Say and write mass</p> <p>Compare weights</p> <p>Select coins for different amounts (not mixing pounds and pence)</p>	<p>Calculate change (not mixing pounds and pence)</p> <p>Draw hands on a clock face</p>
Additional National Curriculum guidance:		
	<p>Use a range of measuring tools</p> <p>Measure and record using dm/cm, g/kg and l</p> <p>Compare measurement using vocabulary: long/short, heavier/lighter, half full/quarter full, full/empty</p> <p>Recognise the value of coins and notes</p>	<p>Read times: o'clock and half past</p> <p>Use time vocabulary: before, after, today, tomorrow, yesterday, seconds, minutes, hours, morning, afternoon, quicker/slower, earlier/later</p>

## Arithmetic 2

Autumn	Spring	Summer
Calculate + and - maths stories Calculate x maths stories	Calculate ÷ maths stories Calculate maths stories involving all four operations Calculate addition and subtraction maths stories involving whole, 1/2 and 1/4	Understand embellished and basic real-life stories Solve addition and subtraction word problems
Additional National Curriculum guidance:		
+ and - using concrete objects and pictorial representation x using concrete objects, pictorial representations and arrays	÷ using concrete objects, pictorial representations and arrays	Solve problems using pictorial representations

## Reasoning

Autumn	Spring	Summer
Write numbers 0-9 and fractions Calculate + and - maths stories Use comparative language: bigger/smaller, equal to, difference between	Create and draw basic and embellished real-life addition and subtraction stories	Shade $\frac{1}{2}$ , $\frac{1}{4}$ and $\frac{3}{4}$ of a shape Months of the year Create a bar chart
Additional National Curriculum guidance:		
Understand language involved: add, altogether, total, take away, more than, less than		Recognise and find 1/2 of an object, shape and quantity Recognise and find 1/4 of an object, shape and quantity

# Year 1

## Daily Practice

Count in ones along a number line	Number bonds to 10
Use positional vocabulary: top, bottom, left and write	Number bonds to 20
Count days and dates on a calendar	Find 10 more or less than a number
Identify shapes: triangles, quadrilaterals, pentagons and hexagons	Fill in missing numbers
Draw straight lines between dots	Match coins to the price of an item
Read and write fractions: $\frac{1}{2}$ and $\frac{1}{4}$	Estimate number of objects using groups of 2, 5 and 10
Calculate totals of money up to 10p	Complete a flow diagram: + - x
Recognise odd and even numbers	Compare times of the day
Count movements on a number line	Compare prices of objects
Additional National Curriculum guidance:	
Count forwards and backwards to and across 100	Create repeating patterns with objects and shapes
Read and write numbers to 100	Double numbers to 10
Count in 2s, 5s and 10s forwards and backwards	Halve numbers to 20
Identify 1 more and 1 less than numbers to 100	Know and order days of the week
Order: first, second, third	Know and order months of the year
Read and write numbers to 20 in numerals and words	Know number bonds to 20 and related subtraction facts
Order numbers	Solve missing number and symbol maths stories
Compare amounts: equal to, more than, less than, fewer than, most, least	

## Year 2

### Arithmetic

Autumn	Spring	Summer
Calculate vertical + and - maths stories Calculate + - x and ÷ maths stories involving $\frac{1}{2}$ and $\frac{1}{4}$ Calculate vertical addition with one tricky column	Complete vertical subtraction with one tricky column Solve addition and subtraction word problems	Solve word problems involving all four operations Write horizontal maths stories vertically and solve with one tricky column
Additional National Curriculum guidance:		
Recall addition and subtraction facts to 20 Use language: sum and difference Recognise place value of each digit	Partition in different ways (when teaching funny counting) e.g. $53=50+3$ or $40+13$ Use pictorial representations	

### Geometry

Autumn	Spring	Summer
Make and name 2D shapes using dm and find the perimeter Identify lines of symmetry in 2D shapes Identify right angles	Describe the properties of 3D shapes: number of faces, vertices, edges and shape of faces Identify lines of symmetry in 2D shapes Identify angles	Name 2D shapes: polygons, quadrilaterals, hexagon, pentagon, octagon Name special 2D shapes: isosceles triangle, equilateral triangle, right-angled triangle, rectangle, square Recognise 3D shapes: name prisms and pyramids Use nets for 3D shapes
Additional National Curriculum guidance:		
2D shape properties: corner, sides, diagonal, vertical, horizontal, symmetry Rotation as a turn or in terms of right angles for $\frac{1}{4}$ , $\frac{1}{2}$ and $\frac{3}{4}$ turns Rotate clockwise and anti-clockwise	Name 3D shapes: cuboid, prism, cylinder, cone, pyramid Sort 3D shape Sort 2D shapes Patterns/sequences of shape in different orientations	Name 2D and 3D shapes in different orientations

## Data and Measures

Autumn	Spring	Summer
Read times: o'clock, quarter past, half past, quarter to	Identify explicit and implicit information in grids and bar charts	Interpret bar charts and pictograms
Draw the hands on a clock face	Measure length using cm, mm, dm, m	Measure length in mm
Read and write digital times	Calculate change	Read and write digital times
Select and use measuring tools		
Additional National Curriculum guidance:		
Know the number of minutes in an hour and hours in a day	Use symbol £ and p separately	Pictograms and bar charts in units of 2, 5 and 10
Read and write time to 5 minutes	Find combinations of coins to make totals	Interpret tally charts and tables
Estimate and measure in mm, cm, m, g, kg, ml, l, °C	Money word problems	Construct simple pictograms, tally charts, block diagrams and tables
Compare measurements using $\leq$ and 'twice as high' 'half as wide'		Compare and sequence intervals of time

## Arithmetic 2

Autumn	Spring	Summer
Identify maths stories and basic real-life story in embellished stories	Partition numbers	Number puzzles: order numbers, create numbers, money puzzles, missing numbers and symbols
Identify implicit and explicit information	Write mixed numbers	
	Difference between	Find $\frac{1}{2}$ and $\frac{1}{4}$ of numbers and objects
	Number sequences	Write numbers shown on an abacus
	Number puzzles: totals of money, missing numbers, find ways to make a total	Sort numbers using Carroll and Venn diagrams
Additional National Curriculum guidance:		
		Find, name, write fractions of a length, shape, quantity: $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{2}{4}, \frac{1}{3}$
		Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$



## Reasoning

Autumn	Spring	Summer
Inverse of addition	Solve word problems involving all four operations	Select and use measuring tools
Commutative law		Solve measuring word problems
Inverse of multiplication	Type 1 and Type 2 division	Type 1 and Type 2 multiplication
Grid method x and ÷		Create x and ÷ maths stories about 0, 00 and 000
Additional National Curriculum guidance:		
Solve missing number problems	Use pictorial representations	Recall multiplication and division facts for 2, 5 and 10 times tables
Use related facts e.g. $3+4=70$ therefore $30+40=70$		
Use arrays		

## Daily Practice

Find 10 more or less than a number	Repeated addition and multiplication SVDA
Find 20 more or less than a number	Repeated subtraction and division SVDA
Recall multiplication facts for 2, 5 and 10 times tables	Missing number maths stories
Know months of the year and number of days in each month	Compare numbers to 100 using $<=>$
Recall addition facts and corresponding subtraction facts	Find missing tens or unit number
Number bonds to 50	Add, subtract and multiply cumulatively
Use number line to add	Round numbers to the nearest 10
Number pairs with 2 digit totals	Estimate answers to calculations
Money SVDA	Estimate number of objects
Identify totals of money	Compare time durations
Read information from calendars	Create and describe number patterns
Use calculator for all four operations	Identify symmetrical patterns
Put events in chronological order	
Additional National Curriculum guidance:	
Count in 2s, 3s, 5s and 10s forwards and backwards	Recognise odd and even numbers
Read and write 0-100 in numerals and words	Doubling and halving amounts to 100
Order numbers to 100	Recognise doubling as $\times 2$ and halving as $\div 2$
Add and subtract mentally a 2 digit number and ones/tens	Count in fractions to 10 (e.g. $0 \frac{1}{4} \frac{1}{2} \frac{3}{4} 1$ )
Add and subtract mentally two 2 digit numbers	Recognise odd and even numbers

## Year 3

### Arithmetic

Autumn	Spring	Summer
Calculate + and - maths stories involving mixed numbers	Calculate + - x and ÷ maths stories involving fifths and sevenths	Calculate + - x and ÷ maths stories involving negative numbers
Vertical + and - with tricky columns (TU)	Vertical + and - with tricky columns (TU)	Calculate + - x and ÷ maths stories involving fifths and sevenths
Calculate + - x and ÷ maths stories involving fifths	Calculate + - x and ÷ maths stories involving negative numbers	Vertical + and - with tricky columns (HTU)
Additional National Curriculum guidance:		
Recognise place value of each digit	Solve problems involving fractions	
Partition in different ways e.g. 153=100+50+3 or 140+13		

### Geometry

Autumn	Spring	Summer
Investigate properties of lines	Identify degrees in $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ turns	Use a compass and ruler to draw triangles
Draw and measure lines	Draw angles multiples of $10^\circ$	Compare and draw triangles specified by co-ordinates
Name polygons	Use set squares to identify and draw right angles	Identify pyramids and prisms from its net
Distinguish between clockwise and anti-clockwise	Recognise parallel and perpendicular lines	Recognise 3D shapes from 2D drawings
Plot co-ordinates	Plot and draw lines	Identify and draw types of triangles
Additional National Curriculum guidance:		
Recognise symmetrical and non-symmetrical polygons and polyhedra	Identify whether angles are right angles, acute or obtuse	Make 3D shapes using modelling material
	Identify horizontal and vertical lines	Recognise 3D shapes in different orientations

## Data and Measures

Autumn	Spring	Summer
Write digital times Calculate time differences and durations Use compass to draw and measure circles and hexagons	Interpret data in grid, pie charts and bar charts Measure length and mass Calculate area, volume, length and perimeter of shapes	Create and interpret tally charts and bar charts Calculate totals and difference between prices Estimate and measure mass and capacity Calculate area and volume Solve area word problems
Additional National Curriculum guidance:		
Read digital 12-hour clocks Tell the time using Roman numerals Use vocabulary: o'clock, a.m., p.m., morning, afternoon, noon and midnight	Units of 2, 5 and 10 Interpret pictograms Solve one and two step problems e.g. how many more/fewer? Use mm/cm/m, g/kg and mixed units e.g. 1kg and 200g Compare measurements Add and subtract measurements	Add and subtract money (mixed units) and record £ and p separately Calculate change

## Arithmetic 2

Autumn	Spring	Summer
Calculate fractions of quantities Solve word problems involving fractions of quantities	Multiply TU X U using grid method Solve division word problems Express remainders as a fraction	Use all four operations including tenths Calculate vertical + and - including decimals Write squares and square roots Identify the operation required to solve a word problem
Additional National Curriculum guidance:		
Compare and order fractions Equivalent fractions		Identify number of tenths e.g. 34.2 2 tenths Count up and down in tenths

## Reasoning

Autumn	Spring	Summer
Use vertical + and - to solve word problems	Multiply TU x U by partitioning	Use known facts to calculate maths stories
Order numbers	Multiply TU x U using grid method	Identify fractions that add to 1
Solve x and ÷ word problems	Use inverse for division with remainders	Calculate difference between fractions
	Write a ratio as a fraction	Partition numbers to solve maths stories involving all four operations <sup>1</sup>
		Solve division word problems
		Odd and even numbers
		Calculate total cost and difference between prices
		Number puzzles
Additional National Curriculum guidance:		
Solve problems involving four times as high, eight times as long		

## Daily Practice

Recall multiplication facts from 2, 5 and 10 times tables	Convert between ml/l, mm/cm/dm/m
Recall multiplication facts from 3 and 4 times tables	Convert times between analogue and digital form
Recognise equivalences e.g. 2m=200cm	Add and subtract money mentally
Convert between g/kg, cm/dm/mm	Round numbers to the nearest 10 or 100
Multiply a 2, 3 and 4 digit multiple of 10 by a 1 digit number	
Additional National Curriculum guidance:	
Count in 2s, 3s, 4s, 5s, 8s, 10s, 50s and 100s forwards and backwards	Recognise acute, obtuse and right angles
Count forwards and backwards in tenths	Identify horizontal, vertical, parallel and perpendicular lines
Recall division facts from 3, 4 and 8 times tables	Know number of seconds in a minute
Find 10 more or less than a number	Know number of days in each month
Find 100 more or less than a number	Know number of days in a year and leap year
Read and write numbers to 1000 in numerals and words	Read analogue times to 5 minutes
Compare and order numbers to 1000	Read and write times to the nearest minute
	Add and subtract mentally a 3 digit number and ones/tens/hundreds

## Year 4

### Arithmetic

Autumn	Spring	Summer
Calculate maths stories for all four operations involving mixed numbers, halves and quarters	Calculate maths stories for all four operations involving fractions, mixed numbers and negative numbers	Calculate percentages of whole number quantity
Calculate maths stories for all four operations with vulgar fractions and negative numbers	Place value (4 digit numbers)	Calculate decimal number percentages using a calculator
Read, write and convert between fractions and decimals	Vertical + and - involving decimals	Round decimal fractions
Calculate maths stories for all four operations involving decimal fractions	Multiply TUxTU using grid method	Calculate + and - using negative numbers
	Divide HTU/TU by U using grid method	Multiply TUxTU using grid method
		Divide HTU/TU by U using grid method
Additional National Curriculum guidance:		
Compare and order decimals (up to 2dp)	Multiply HTU x U using grid method	
Identify number of hundredths e.g. 34.12 12 hundredths	Use distributive law e.g. $39 \times 7 = 30 \times 7 + 9 \times 7$	

### Geometry

Autumn	Spring	Summer
Draw objects in a mirror line	Use vocabulary for circles accurately	Draw triangles using a compass
Use a protractor to draw angles	Draw shapes using a compass	Measure angles using a protractor
Identify angles	Label axes (positive and negative)	Draw acute and obtuse angles
	Draw shapes on axes	
	Name lines of symmetry	
Additional National Curriculum guidance:		
Compare and order angles	Describe position on a grid as co-ordinates	
	Describe movements as translations	
	Identify regular and irregular polygons	
	Identify lines of symmetry in different orientations	
	Complete a simple symmetric figure	

## Data and Measures

Autumn	Spring	Summer
<p>Read metric prefixes for length, mass and volume</p> <p>Compare metric units</p> <p>Read metric equivalences using decimal point</p> <p>Calculate area and volume</p>	<p>Calculate the circumference of circle</p> <p>Find the mean</p>	<p>Calculate equivalent fractions</p> <p>Calculate fractions of quantities using equivalent fractions</p> <p>Use ratio to convert measurements</p>
Additional National Curriculum guidance:		
<p>Measure using a range of units</p> <p>Convert between units of measure</p> <p>Measure and calculate perimeter</p>		<p>Recognise equivalent fractions e.g. <math>\frac{6}{9} = \frac{2}{3}</math></p>
<p><i>Not explicitly covered in maths lessons, but needs to be taught perhaps in thematic or science:</i></p> <ul style="list-style-type: none"> <li>* Read and write analogue and digital time (12 and 24 hour)</li> <li>* Solve time problems using converting: hours to minutes, minutes to seconds, years to months and weeks to days</li> <li>* Present discrete and continuous data using graphical methods including bar charts and time graphs</li> <li>* Use a range of scales when presenting and interpreting data</li> <li>* Answer comparison, sum and difference between problems about data presented in bar charts, pictograms, tables and graphs</li> </ul>		

## Arithmetic 2

Autumn	Spring	Summer
<p>Multiply TUXTU using grid method</p> <p>Calculate one step word problems involving all four operations</p> <p>Use a calculator to solve one step measure word problems involving decimals</p>	<p>Group calculations to solve maths stories</p> <p>Solve measure word problems</p> <p>Solve word problems involving decimal quantities</p>	<p>Solve percentage word problems</p> <p>Solve fraction and percentage word problems involving all four operations</p> <p>Round decimals</p>
Additional National Curriculum guidance:		
		<p>Solve two step addition and subtraction word problems</p>

## Reasoning

Autumn	Spring	Summer
Read and write numbers up to billions	Mentally x three 1 digit numbers	Identify terms
Read and write powers of 10	Use index notation for powers of 10	Use algebraic expressions
Use known facts to calculate x and ÷ maths stories	Multiply three numbers with a decimal fraction using a calculator	
Additional National Curriculum guidance:		
Recognise the place value of each digit		
Derive fact e.g. $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$		

## Daily Practice

Round to the nearest 10 and 100	Recall multiples of 3, 4, 5, 6, 7, 9 and 10
Recall multiplication and division facts up to 100	Give factors of 1, 5, 7, 9
Convert m to cm, kg to g and ml to l	Give factors of 12, 15, 16 and 18
Find 1 more or less than any number (positive and negative)	Find common equivalent fractions
Convert between decimal and vulgar fractions	Give multiples of 5, 7, 8 and 10
Convert pence to pound	Give factors of 10, 15, 18, 20, 24 and 25
Convert time analogue and digital	Convert between decimals and fractions for tenths, hundredths and thousandths
Recall multiples of 8, 9 and 10	Convert between miles and km
Give factors of 4, 10, 12 and 15	
Convert mm to m and pounds to pence	
Additional National Curriculum guidance:	
Count in multiples of 6, 7, 9, 25 and 1000	Recognise and use factor pairs up to 144
Find 1000 more or less than a given number	Count up and down in hundredths
Count forwards and backwards (negative numbers)	Recognise and write decimal equivalents to
Order and compare numbers beyond 1000	Compare and order decimals (up to 2dp)
Round numbers to the nearest 10, 100 or 1000	Classify triangles: equilateral, isosceles, scalene
Read Roman numerals to 100	Classify quadrilaterals: parallelogram, rhombus, trapezium
Recall multiplication and division facts up to $12 \times 12$	
Compare amounts of money in pounds and pence (using decimal notation)	

## Year 5

### Arithmetic

Autumn	Spring	Summer
Vertical + and - with more than one tricky column	Use fractions as divisions	Divide HTU $\div$ U using grid method
Calculate + - $\times$ $\div$ maths stories involving vulgar fractions and mixed numbers	Convert vulgar fractions to finite decimal	Multiply and divide decimals (up to 3dp) by multiples of powers of 10
Vertical + and—decimals with more than one tricky column	Use four operations with positive and negative numbers	Use derived products to calculate $\times$ and $\div$
Multiply vulgar fractions	Multiply TU $\times$ TU using grid method	
	Multiply HTU $\times$ TU with decimals using grid method	
Additional National Curriculum guidance:		
Identify the value of each digit	Multiply THTU $\times$ TU/U	Divide THTU $\div$ U using grid method
Order and compare fractions and decimals	Multiply by 10, 100 and 1000	Divide by 10, 100 and 1000
Recognise and use thousandths		Interpret remainders as fractions, decimals or rounding

### Geometry

Autumn	Spring	Summer
Investigate properties of shape and symmetry	Calculate the circumference and area of a circle	Investigate angles of polygons
Name and draw angles: acute, obtuse, reflex and right	Explore the properties of angles	Recognise, name and sketch polygons
Name and calculate vertically opposite and supplementary angles		Identify properties of polygons
Draw angles using a protractor		
Additional National Curriculum guidance:		
Estimate and compare angles		Use properties of rectangles to find missing lengths and angles
Use markings for parallel lines and right angles		Distinguish between regular and irregular shapes



## Data and Measures

Autumn	Spring	Summer
Solve measure word problems involving all four operations and percentage increase/decrease	Interpret a calendar and timetable	Use ratio to convert between units of measure
Investigate 3D shapes	Use time durations in calculations and word problems	Estimate area of regular and irregular shapes
Convert metric and imperial units	Construct a bar chart	Calculate time durations
Read scales	Find the mode	Solve time word problems
	Draw and interpret distance-time graphs	
	Round measures	
Additional National Curriculum guidance:		
Explain operations and methods when solving problems	Solve comparison, sum and difference problems about a line graph	Calculate perimeter in cm and m
Convert between fractions, decimals and percentages		Compare area of shapes using $\text{cm}^2$ and $\text{m}^2$
		Estimate volume and capacity
		Express missing measures algebraically

## Arithmetic 2

Autumn	Spring	Summer
Complete missing number grids and sentences	Use divisibility tests	Evaluate terms and products in expressions including brackets
Complete number sequences involving square numbers	Investigate factors and proper factors	
Solve one and two step word problems	Identify prime numbers (0-100)	
Use $\llbracket \gg$	Write numbers as a product of their prime factors	
Investigate factors and proper factors	Investigate factors	
Additional National Curriculum guidance:		
Find common factors of two numbers	Use vocabulary: prime number, prime factors, composite (non-prime) number	
Understand term: factor, multiple, square and cube number		
Use notation $(^2)$ and $(^3)$		

## Reasoning

Autumn	Spring	Summer
Write and convert times using 24 hour notation	Solve measure and fraction problems by exploring relationships	Carry out investigations involving shape, number and real-life situations
Calculate time duration (24 hour)	Solve one, two and three step money problems	Use timetables
Solve algebraic equations	Solve puzzles by calculating quantities	Calculate durations: difference between, total and mean
		Calculate equivalences and fractions of periods of time
Additional National Curriculum guidance:		
Solve problems involving decimals		

## Daily Practice

Add and subtract money	Calculate time durations
Recall multiplication and division facts (up to 12x12)	Find equivalent fractions
Give multiples of all times tables	Order decimal fractions using a number line
Give factors	Convert between fractions, decimals and percentages
Identify value of digits (including decimals)	Round to the nearest 100
Convert times 12 hour to 24 hour	Find the mode and median of a data sample
Convert measures g to kg, l to ml, cm to m, km to m	Multiply and divide by 15 and 20
Convert fractions to decimals	
Additional National Curriculum guidance:	
Read and write numbers to 1 000 000	Round decimals to the nearest whole number
Order numbers to 1 000 000	Order and compare fractions
Compare numbers to 1 000 000	Order and compare decimals
Count forwards or backwards in steps of 100, 1000 and 10000	Mentally add and subtract tenths
Count forwards and backwards (negative numbers)	Add and subtract decimals finding complements of 1 e.g. 0.83+0.17
Round numbers to the nearest 10, 100, 1000, 10000, 100000	Recognise and use square roots and square numbers
Count forwards and backwards in decimals and fractions	Read Roman numerals to 1000
Mentally add and subtract large numbers e.g. 12462-2300=10162	
Recall prime numbers to 19	
Recognise years written in Roman numerals	

## Year 6

### Arithmetic

Autumn	Spring	Summer
<p>Multiply HTUxTU using grid method</p> <p>Estimate the value of products by rounding including decimals</p> <p>Divide THTU÷U using grid method</p> <p>Estimate the value of quotients, including decimals, by rounding</p>	<p>Use equivalent fractions in calculations using all four operations</p> <p>Calculate all four operations using negative numbers and vulgar fractions</p>	<p>Use the formulae for diameter, circumference and area of a circle</p> <p>Use the formulae for area and volume</p> <p>Convert between decimal fractions and vulgar fractions</p> <p>Write recurring infinite decimals in abbreviated forms</p>
Additional National Curriculum guidance:		
<p>Multiply 1 digit number with 2dp by whole numbers</p> <p>Divide decimal numbers by U</p> <p>Interpret remainders as whole numbers, fractions or by rounding</p> <p>Identify the value of each digit</p>	<p>Compare and order fractions</p> <p>When calculating with fractions write answers in its simplest form</p> <p>Divide proper fractions by whole numbers</p>	<p>Illustrate and name parts of a circle: radius, diameter and circumference</p> <p>Associate a fraction with division</p>

### Geometry

Autumn	Spring	Summer
<p>Find the sum of interior and exterior angles of a polygon</p> <p>Recognise reflection, translation, enlargement and rotation</p> <p>Name transformations of shapes</p>	<p>Measure angles</p> <p>Measure length</p> <p>Draw images and complete shapes using lines of reflection</p> <p>Calculate angles in isosceles triangle</p> <p>Sort quadrilaterals</p> <p>Complete coordinates of shapes</p> <p>Identify and write the order of rotational symmetry</p>	<p>Calculate the interior, exterior and missing angles</p> <p>Draw the perpendicular lines</p> <p>Draw the bisector of an angle</p> <p>Draw the circum-circle of a triangle</p> <p>Draw the in-circle of a triangle</p>
Additional National Curriculum guidance:		
<p>Draw and translate simple shapes and reflect them in axes</p>	<p>Draw 2D shapes using given dimensions and angles</p> <p>Recognise, describe and build 3D shapes including making nets</p> <p>Compare and classify geometric shapes</p> <p>Draw and label a pair of axes in all four quadrants</p> <p>Describe positions on the full co-ordinate grid</p>	<p>Find unknown angles: triangles, quadrilaterals and regular polygons</p>

## Data and Measures

Autumn	Spring	Summer
<p>Solve measuring word problem using km, ml, l, g and kg</p> <p>Draw a pie chart</p>	<p>Solve problems involving ratio and proportion</p> <p>Read scales (mass)</p> <p>Compare weighing scales</p> <p>Construct and interpret frequency tables, bar charts and pie charts</p> <p>Plan and carry out a survey using discrete and grouped data</p>	<p>Convert between yards and metres</p> <p>Calculate perimeter and area of compound shapes</p> <p>Calculate surface area and volume of cuboids</p> <p>Solve problems with cuboids</p> <p>Understand the golden ratio</p> <p>Calculate ratios and use ratios to construct shapes</p> <p>Collect, organise, select and present information</p>
Additional National Curriculum guidance:		
<p>Solve problems involving conversion between units</p> <p>Solve money problems</p> <p>Link percentages of <math>360^\circ</math> to calculating angles of pie charts</p>	<p>Compare quantities using the notation a:b</p> <p>Solve problems involving the relative sizes of two quantities</p> <p>Convert measurements using decimal notation up to 3dp</p> <p>Construct line graphs</p>	<p>Convert between miles and km</p> <p>Know approximate conversions</p> <p>Recognise shapes can have same area but different perimeter and vice versa</p> <p>Calculate the area of parallelograms and triangles</p> <p>Estimate and compare volumes: <math>\text{cm}^3</math>, <math>\text{m}^3</math>, <math>\text{mm}^3</math>, <math>\text{km}^3</math></p>

## Arithmetic 2

Autumn	Spring	Summer
<p>Multiply HTUxTU using short method</p> <p>Divide HTUxTU using short method with remainders</p> <p>Convert between fractions, decimals and percentages</p>	<p>Ratio of quantities</p> <p>Write a quantity as a fraction or percentage of the total quantity</p> <p>Solve word problems by involving percentage increase/decrease</p> <p>Solve money problems using all four operations</p> <p>Add and subtract squares and cubes of numbers</p> <p>Calculate products</p>	<p>Use algebraic notation for the sum, difference, product, and quotient of two numbers</p> <p>Find the greatest or smallest sums, difference, products and quotients of two numbers within a possible range</p> <p>Calculate products</p> <p>Solve number puzzles involving algebraic terms</p> <p>Identify and divide numbers by their factors</p>
Additional National Curriculum guidance:		
<p>Interpret remainders as whole numbers, fractions or by rounding</p>		<p>Express missing number problems algebraically</p>

## Reasoning

Autumn	Spring	Summer
Calculate mean, median, mode and range Probability	Interpret a distance-time graph Interpret a temperature-time graph Identify terms and products in expressions Evaluate expressions with and without brackets	Solve linear equations that involve one operation with whole and decimal numbers Express vulgar fractions as percentages
Additional National Curriculum guidance:		
	Construct line graphs Explore the order of operations using brackets	Enumerate possibilities of combinations of two variables

## Daily Practice

Recall multiplication and division facts (up to 12x12) Multiply by 15 Round numbers to 1dp Write factors and multiples of given numbers Convert between m and km, cm and m, cm and mm, ml and l and g and kg Find a fraction or percentage of whole number Calculate time duration Calculate angles in a triangle	Convert between fractions, decimals and percentages Multiply by 25 Multiply and divide pairs of multiples of 10 and 100 Find equivalent fractions Round numbers to 2dp Write a number as product of its prime factor Round numbers to 3dp
Additional National Curriculum guidance:	
Read and write numbers to 10 000 000 Order numbers to 10 000 000 Compare numbers to 10 000 000 Round numbers with accuracy (nearest 10, 20, 50 etc.) Count forwards and backwards (negative numbers)	Use the four operations mentally Identify common factors, common multiples and prime numbers Partition decimals to 3dp Mentally add and subtract negative numbers Compare and order fractions including fractions >1