

How is maths taught in Years 5 and 6?

In Year 5 and Year 6, children build on their learning from Years 3 and 4, to develop their understanding of number, geometry, statistics, measures, ratio and proportion and also begin to use algebraic formulae. By this stage, they have learnt the formal written methods for calculating but are now introduced to long multiplication and long division, so that they can calculate with larger numbers. **Concrete apparatus** continue to be used to model and support their learning, as well as **pictorial representations**, such as bar modelling. They will mostly work using **abstract methods**, having already been taught to understand how and why these methods work. They begin to select the most efficient written or mental strategies to solve calculations, depending on the numbers involved. **Fluency** is established for each objective, before applying their learning to **reasoning and problem solving** tasks.

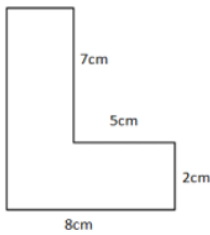
Children will complete assessment tasks when they have completed 'blocks' of learning and will have termly arithmetic and reasoning tests to enable teachers to assess their learning. In Year 6, past End of Key Stage 2 assessment papers are used throughout the year for practice and to monitor their progress in arithmetic and reasoning and problem solving. In the first half of the summer term, the Year 6 children will complete the national statutory End of Key Stage 2 tests. For maths, this consists of an arithmetic paper and two reasoning papers. The arithmetic paper is a 30-minute test (40 marks available) and the two reasoning papers are each 40-minute tests (35 marks available in each). These tests are completed on the statutory allocated days, during a week in May. The tests are marked externally and the raw score is converted to a scaled score. A scaled score of 100 or more indicates a child has met the **Expected Standard** for the End of Key Stage 2. A scaled score of 110-120 indicates a child is working at the **Higher Standard** ('Greater Depth' standard). If a scaled score is 99 or less, this indicates that a child has not met the end of Key Stage 2 Expected Standard. Parents will receive a copy of their child's scaled scores and grading. Towards the end of the summer term, Year 6 Class teachers meet with secondary school leads for Year 7 and discuss your child's ability and progress in maths, including test outcomes and classwork.

At Parkfield, we follow 'White Rose Maths' primary scheme of learning as a key resource to map out our curriculum and ensure appropriate progression from Year 1- Year 6. This scheme is used alongside other quality resources to ensure children are exposed to a range of fluency, reasoning and problem solving activities that foster our 'mastery approach'. The 'mastery approach' is about teaching for understanding – ensuring the children know why they are doing certain mathematical processes, how they work and how to apply them in a range of situations. It opposes teaching 'tricks' or procedures without understanding, which results in superficial learning. Key aspects of the mastery approach:

- Children learn a maths topic in-depth, before moving onto the next maths topic
- Maths topics are progressive E.g. ensuring place value is secure before working on calculations
- For each National Curriculum objective, children solve questions, problems and work on tasks that are presented in a variety of ways
- Concrete apparatus, pictorial representations and abstract representations are used
- Correct use of mathematical vocabulary
- Collaborative working
- Explaining, modelling and justifying mathematical ideas

- Teachers address misconceptions and identify ‘what it is NOT’ as well as ‘what it IS’ E.g. Children will learn how to complete a particular mathematical procedure (what it IS), but typical misconceptions will also be modelled by their teacher to promote discussion and ensure they do not make these mistakes themselves (what it is NOT). E.g. Calculating the perimeter of composite rectilinear shapes

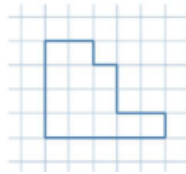
- **It is...**



Model finding the missing lengths to work out the total perimeter

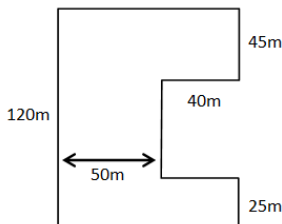
- **It is also...**

Each square has an area of 4 square cm.
What is the perimeter of the whole shape?



Model using knowledge of the area of each small square to work out the length of the sides, then calculate the total perimeter

- **It is not...**



Tim thinks he can work out the perimeter of this shape using the measures given. Explain WHY this is not correct.

Children have a daily maths lesson and also additional ‘Number fluency’ sessions throughout the week, to regularly practise and consolidate number facts, counting, and mental and written calculations. This regular practice keeps these key skills sharp, and especially when other mathematical concepts are the current focus of maths lessons.

In classrooms, children have access to a wide range of maths resources to support them with their learning. All classes have a ‘Maths Working Wall’, which displays current and relevant procedures, vocabulary, models and images for their reference.

Every week, children will be set a piece of maths homework that will enable them to practise and consolidate their learning in class. Practising their number bonds and times tables at home will also be of great benefit.

What will my child learn about in maths?

We follow the National Curriculum and teach the statutory objectives for each year group.

Year 5

Number – number and place value

Statutory requirements

Pupils should be taught to:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- solve number problems and practical problems that involve all of the above
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Number – fractions (including decimals and percentages)

Statutory requirements

Pupils should be taught to:

- compare and order fractions whose denominators are all multiples of the same number
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

- read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places
- solve problems involving number up to three decimal places
- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
- solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.

Measurement

Statutory requirements

Pupils should be taught 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)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Geometry – properties of shapes

Statutory requirements

Pupils should be taught to:

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees ($^{\circ}$)
- identify:
 - angles at a point and one whole turn (total 360°)
 - angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°)
 - other multiples of 90°
- use the properties of rectangles to deduce related facts and find missing lengths and angles
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Geometry – position and direction

Statutory requirements

Pupils should be taught to:

- identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

Statistics

Statutory requirements

Pupils should be taught to:



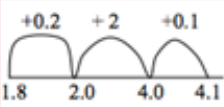


- solve comparison, sum and difference problems using information presented in a line graph
- complete, read and interpret information in tables, including timetables.

Calculation in Year 5:

Number – addition and subtraction

Number – multiplication and division

Our calculation policy and posters set out how we teach the four operations in line with the requirements of the National Curriculum:

Year Five and Year Six	
<p>ADDITION</p> 	<ul style="list-style-type: none"> Children to add whole numbers with more than 4 digits, including using formal written methods (columnar addition) in Y5 and two decimal places and then and be able to add decimals up to three decimal places by the end of Y6. <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 45867 \\ + 32192 \\ \hline 78059 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 3.46 \\ + 3.792 \\ \hline 7.252 \end{array}$ <p style="font-size: small; color: red;">Zero used as a place value holder.</p> </div> <div style="text-align: center;"> $\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \end{array}$ </div> </div>
<p>SUBTRACTION</p> 	<p>Subtract pairs of four digits and up to two decimal places.</p> <ul style="list-style-type: none"> Children still use number line to find the difference. <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 2810816 \\ - 2128 \\ \hline 28928 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 6796.5 \\ - 372.5 \\ \hline 6424 \end{array}$ </div> <div style="text-align: center;">  <p>4.1 - 1.8 = 2.3</p> </div> </div>
<p>MULTIPLICATION</p> 	<p>Multiply up to 4-digit number by 1 digit or 2 digits using formal written methods, including long multiplication for 2 digit numbers</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 1234 \\ \times 16 \\ \hline 7404 \\ 12340 \\ \hline 19744 \end{array}$ <p style="font-size: small;">(1234 x 6) (1234 x 10)</p> </div> <div style="text-align: center;"> $\begin{array}{r} 3652 \\ \times 8 \\ \hline 29216 \end{array}$ </div> </div>
<p>DIVISION</p> 	<p>Divide numbers up to 4 digits by one digit using the formal written method of short division and interpret remainders as appropriate to the context.</p> <div style="text-align: center;"> $\begin{array}{r} 0663r5 \\ 8 \overline{)5309} \end{array}$ </div>

Year 6

Number – number and place value

Statutory requirements

Pupils should be taught to:

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.

Number – fractions (including decimals and percentages)

Statutory requirements

Pupils should be taught to:

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Ratio and proportion

Statutory requirements

Pupils should be taught to:

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

Measurement

Statutory requirements

Pupils should be taught to:

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa
- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].

Statistics

Statutory requirements

Pupils should be taught to:

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

Algebra

Statutory requirements

Pupils should be taught to:

- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.

Geometry – properties of shapes

Statutory requirements

Pupils should be taught to:

- draw 2-D shapes using given dimensions and angles
- recognise, describe and build simple 3-D shapes, including making nets
- compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Geometry – position and direction

Statutory requirements

Pupils should be taught to:




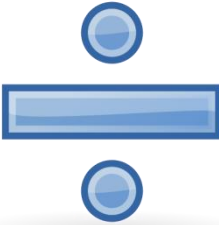
- describe positions on the full coordinate grid (all four quadrants)
- draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Calculation in Year 6:

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<p>SUBTRACTION</p> 	<div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 480699 \\ - 89949 \\ \hline 60750 \end{array}$ </div> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 10.5 \text{ kg} \\ - 36.08 \text{ kg} \\ \hline 69.339 \text{ kg} \end{array}$ </div> <ul style="list-style-type: none"> Children to use compact method of subtraction. Subtraction of decimals up to three decimal places.
<p>MULTIPLICATION</p> 	<p>Multiply multi digit numbers up to 4 digits by 2-digit number using long multiplication.</p> <p>Multiply one digit numbers with up to 2.d.p by whole numbers.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 2368 \\ \times 34 \\ \hline 9472 \\ 71040 \\ \hline 80512 \end{array}$ </div> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array}$ </div> </div>
<p>DIVISION</p> 	<p>Divide numbers up to four digits by 2 digit numbers using the formal method of long division and interpret remainders as decimals up to 2.d.p, fractions and whole numbers - don't forget the key! Then short division 4 digit divided by 2 digits.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 0812.125 \\ 8 \overline{)6497.000} \end{array}$ </div> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 0318 \text{ r}5 \\ 20 \overline{)6365} \\ \underline{-60} \\ 36 \\ \underline{-36} \\ 20 \\ \underline{-20} \\ 165 \\ \underline{-160} \\ 5 \end{array}$ </div> </div>

What resources will my child use to help them understand?

Here are some of the resources that children use in Year 3 and Year 4 to help them in their understanding of maths:

Part-Whole Model

The two numbers at the bottom add to make the number above.

Place value counters

Base 10 apparatus (Dienes)

Number lines/ Counting stick / Bead strings

Numicon

Bar modelling

Children also use **dice, dominoes, digit cards** and any other practical equipment in their learning environment to support their understanding.

Children are encouraged to draw pictorial representations of maths equipment to help them with their learning.

What maths vocabulary is used for this age group?

Key vocabulary:

(including vocabulary learnt in earlier years)

<h3>Addition and Subtraction</h3> <p>add, addition, more, plus, make, sum, total, altogether, how many more to make...? how many more is... than...? how much more is...? =, equals, sign, is the same as, tens, ones, hundreds, thousands, ten thousand, hundred thousand, millions, part, whole tenths, hundredths, thousandths</p> <p>subtraction, subtract, take away, difference, difference between, minus, less than, one less, two less... ten less..., partition, recombine, increase / decrease, near multiple of 10 and 100, inverse, rounding, exchange, carry, column method, near double, boundary</p>	
<h3>Multiplication and Division</h3> <p>multiple, multiplication array, multiplication tables / facts, groups of, lots of, times, columns, rows</p> <p>group in pairs, 3s ... 10s etc, equal groups of, divide, \div, divided by, divided into, share</p> <p>short/long multiplication, short/long, division, factor, factor pair, product, times as (big, long, wide etc), quotient, divisor, remainder, cube numbers, prime numbers, composite numbers, power of, square numbers, common factors, prime number, prime factors.</p>	
<h3>Measure</h3> <p>Measure, weigh, length, height, balance, Units of measure – cm/m, m/km, g/kg, ml/l, temperature (degrees)</p> <p>Comparison of measures vocabulary - heavy/lighter/light, long/ shorter/short, full/empty, thick/thin, deep/shallow, wide/narrow etc.</p> <p>Time vocabulary -days of the week, months of the year, quick/slow, today/tomorrow/yesterday, morning/afternoon/evening, early/late, second/minute/hour/day/week/month/year, o'clock, half past, quarter past/to</p> <p>Money vocabulary - coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change, expensive, cheap, coin and note denominations amount, value, worth, approximately, unit, standard unit, metric unit, breadth, perimeter, area, square centimetres, timetable, arrive, depart, imperial, metric, pint, mile</p>	<h3>Geometry</h3> <p>Shape, pattern, flat, curved, straight, round, hollow, solid, corner, face, side, edge, end, circle, triangle, square, rectangle, cube, pyramid, sphere, cone, symmetrical, line of symmetry, mirror line, reflection</p> <p>Position and direction vocabulary - over, under, above, below, top, bottom, side on, in, outside, inside, around, in front, behind, front, back before, after, beside, next to, opposite, apart, rotation, clockwise, anticlockwise, straight line, ninety degree turn, right angle vertex, vertices, layer, prism, polygon, equilateral triangle, isosceles triangle, hexagonal, octagonal, horizontal, vertical, diagonal, compass points, diameter, radius, regular, irregular, concave, convex, translate, translation, co-ordinates, origin, axis, axes, congruent, reflect, reflective symmetry, quadrant, acute, obtuse, reflex, dimensions, net, parallel, perpendicular, x-axis, y-axis</p>
<h3>Fractions</h3> <p>whole, equal parts, one half, two halves, four equal parts, a quarter, two quarters, three quarters, one third, a third, equivalence, equivalent, decimal, decimal fraction, decimal point, decimal place, numerator, denominator, proper/improper fraction, mixed number, percentage, percent, ratio, reduce, simplify, cancel</p>	<h3>Statistics</h3> <p>count, tally, sort, vote, graph, block graph, pictogram, represent, group, set, list, table, label, title, most popular, most common, least popular, least common chart, bar chart, frequency table, diagram, Carroll diagram, Venn diagram, mean, classify, pie chart, line graph</p>

Examples of key questions that are used to assess and develop understanding:

What do you notice?	I wonder if it makes a difference if...
What's the same? What's different?	What if...?
Where could you start? Is it possible to start here?	Why does / doesn't it work?
What does _____ mean?	Can you spot my mistake?
What do you already know about...?	Which is the odd one out? How do you know?
Are you sure? Prove it / Show me using...	What is the relationship between...?
How do you know?	Describe the pattern
How do you know <u>it's not</u> ...?	Can you make a rule / generalisation?
Can you tell me / show me what you were doing?	Show me another example that fits the rule / we could solve in the same way
Why did you use that strategy?	
Is there another way? How many ways are there?	

How can we help at home?

TOP TIPS:

1. Be positive about maths and avoid saying things like 'I can't do maths' or 'I hated maths at school'. A negative attitude could cause your child to think like that themselves.
2. Talk about the maths in everyday life, and ask your child how they work out problems or questions.
3. Let your child enjoy talking about what they've learned, and praise effort and perseverance.

EASY ACTIVITIES TO DO AT HOME:

- Support your child with their weekly maths homework and practising number facts (number bonds and times tables)
- Play games which encourage counting, mental calculation and subitising – snakes and ladders, dice games, dominoes.
- Playing cards can be a great way to practise mental addition and subtraction as well as times tables. For example a simple 2-player game could be where each player turns over a card and the first player to multiply them / add them/ find the difference between the numbers wins the pair. Keep playing until all the cards have been won. The player with the most pairs wins. This can easily be made more challenging by increasing the number of players, therefore multiplying / adding 3 numbers together.
- Give your child the opportunity to practise their times tables on 'Times Table Rock Stars' (www.trockstars.com). This is a fantastic, online game where your child can practise 'quick recall' of their times tables. They create their own rock star avatar and can earn credits to change their character's appearance. They can play against other players too. Your child will have a personal login for the website. Please ask your child's teacher for further information.
- Cooking/ gardening / DIY with your child will help to reinforce their understanding of measures
- Talk about time – for example, how long does it take to walk to school? Practise telling the time on analogue and digital clocks. Encourage your child to read timetables (bus, train, TV etc) to work out durations and organise their own time.
- Put things in order – of weight, height, size. Ask your child to help you organise things at home.
- Talk about the price of items when shopping and which coins are needed. Encourage your child to 'help you at the till' and count out the money needed or check the change. Encourage your child to budget using their pocket money/
- Puzzle books can be a great source of activities to support their mathematical reasoning skills and logic. Puzzles like Sudoku, logic problems and number crosswords are ideal.
- Art and craft activities that involve using a range of 2D and 3D shapes will support their geometry learning. Using a protractor or pair of compasses to create art work will help them become more proficient with these apparatuses.

Useful websites and resources:

www.trockstars.com (your child will have their own login which is available from their teacher)

<https://www.bbc.com/bitesize/subjects/z826n39>

<https://www.topmarks.co.uk/maths-games/7-11-years/ordering-and-sequencing-numbers>

<https://www.familymathstoolkit.org.uk/activities-for-children>

<https://nrich.maths.org/9086>

<https://www.cgpbooks.co.uk/primary-books> - If you are looking for a workbook / revision guide for your child, CGP produce a range of activity books and reference books that are well-suited to primary aged children. They include activities and guidance for the maths national curriculum and different books are available for each age / phase.



BUS TIMETABLE						
Newport	06:50		07:25	08:45	09:10	09:45
Underwood	07:00	07:25	07:41	08:55	09:19	09:53
Magor	07:11	07:41	07:51	09:04	09:31	10:02
Rogiet	07:18	07:59	07:59	09:11	09:38	10:11
Caldicot	07:29	08:12	08:09	09:16	09:47	10:16
Portskewett	07:33	08:15	08:14	09:20	09:53	10:21
Chepstow	07:45	08:30	08:30		10:05	10:40

