

# Brompton & Sawdon CP Whole-School Maths Curriculum

## Rationale

- It is our duty at Brompton & Sawdon CP, as a mainstream school, to provide a curriculum that is **ambitious** and **challenging** for **all** learners (where practical).
- This curriculum must fulfil the requirements set out in the **National Curriculum**. However, at Brompton, we go **beyond** these expectations, delivering a **deep**, as well as a **broad and balanced**, curriculum, which also reflect the needs, **rural context** and interests of our pupils.
- Whilst it is important that students have the opportunity to experience this depth of learning and experience their year group's curriculum and expectations, this should not be at the expense of **mastery** and **long-term retention**.
- When a student has not mastered a year group's curriculum, it is important that leaders and teachers **adapt** their curriculum, resources and practice. This may require teachers to 'secure' previous year group's expectations.
- At Brompton & Sawdon CP we firmly believe that **mixed-aged classes** are a benefit and not a necessity or hindrance; they allow students to progress at their own rate, whether that is allowing students to build on their strengths and looking at the next years' curricula or allowing students the time and support to secure understanding of previous year groups' curricula.
- We recognise, at Brompton, that students' **starting points** and previous educational experiences vary significantly. Our curriculum allows all students, especially the **disadvantaged**, to achieve their potential.

The following whole-school Maths curriculum reflects the above rationale. It also sets out how Brompton & Sawdon CP plan for and deliver (**and go beyond**) the National Curriculum. This is a 'working document'; teachers and leaders adapt the following based on the '*impact*' on students.

This plan outlines *What* is taught (Intent), as well as *When, Where, Why, How* it is taught (Implementation). It breaks down the school's Maths curriculum into each dimension of the subject and then by year group. This allows teachers to clearly see the progression and sequence that skills need to be taught, so they can adapt their practice (if required).

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## Maths – Number and place value

<b>Intent - What is taught? (Objectives)</b> <b>Beyond?</b>	<b>Implementation –</b> <b>When, How, Where and Why?</b>
<p><b><u>Class 1 - Year 1 Students will:</u></b> (if EYFS learning is secure)</p> <p>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <p>count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens given a number, identify one more and one less</p> <p>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</p> <p>read and write numbers from 1 to 20 in numerals and words.</p>	<p>During the starter activity for each day we focus on skills using number. We have 4 days – count it, times it, rehearse it, recall it. This includes questions such as: 'Times it' - Show the 2 times table using Numicon. <i>Can you count in 2's?</i></p> <p>Woven throughout all of the maths learning we do across the year, we follow a LTP which recognises Number, place value, addition, subtraction, measure, multiplication, division, geometry and fractions. Within this, we ensure greater depth by challenging children with questions such as: '  <i>Give the cards 1, 2, 4, 5</i>  <i>Choose from these number cards to make the following numbers. 5, 6, 7, 8, 9, 1</i>  <i>You can use 2 or 3 number cards. Write your answers in full number sentences.'</i></p> <p>Skills checker - Each week the children complete a skills checker that has 10 questions which focus on number and place value, asking questions such as  '<i>Write this number in words - 82</i>'.  '<i>Fill in the missing number - 4, 6, __, 10, 12</i>'</p> <p>Big maths, beat that questions.</p> <p>Within the classroom, our maths working wall represents the concrete, pictorial and abstract methods of each lesson. For example, if we are counting in 2's we will represent this using pairs of socks (concrete), using dots (pictorial) and finally as a sum <math>1 \times 2 = 2</math> (abstract).</p>
<p><b><u>Class 2 - Students will:</u></b> (if previous is secure)</p>	

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## Year 2

count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward

recognise the place value of each digit in a two-digit number (tens, ones)

identify, represent and estimate numbers using different representations, including the number line

compare and order numbers from 0 up to 100; use  $<$ ,  $>$  and  $=$  signs

read and write numbers to at least 100 in numerals and in words

use place value and number facts to solve problems.

## Year 3

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

recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

compare and order numbers up to 1000

identify, represent and estimate numbers using different representations

Learning as part of daily warm up activity and games – Ninja maths, bingo. Understanding checked via Big Maths Beat That and Skills Checker. Sequential teaching of applicable times tables and using existing knowledge (e.g.  $3 \times 10 = 30$ , therefore  $3 \times 5 = 15$ ).

Teaching of part / whole numbers, bar modelling, dienes blocks – using concrete, pictorial and abstract.

Using various methods to identify numbers and classifying them. Teaching with <https://mathsframe.co.uk/en/resources/category/539/compare-and-order-numbers-from-0-up-to-100-use-less-than-great-than-and-equals-signs>

Using physical concrete representations to secure understanding – use of Classroom Secrets (graduated development from Autumn Block 1 Step 01 to Step 10 based on ability and progress) and I See Reasoning (p 21 – 27) Skills Checkers Stage 2 – question 5.

Reasoning and problem-solving integral part of teaching through Classroom Secrets (graduated development from Autumn Block 1 Step 01 to Step 10 based on ability and progress).

Learning as part of daily warm up activity and games – Ninja maths, bingo. Understanding checked via Big Maths Beat That and Skills Checker. Sequential teaching of applicable times tables and using existing knowledge (e.g.  $3 \times 4 = 12$ , therefore  $3 \times 8 = 24$ ). Linking of 50 and 100 to 5 and 10 times tables.

Building up fluency, reasoning and problem solving with [http://media.wix.com/ugd/c415a5\\_00e64c8e0edd41f2b1a529d6cb17d13f.pdf](http://media.wix.com/ugd/c415a5_00e64c8e0edd41f2b1a529d6cb17d13f.pdf)

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<p>read and write numbers up to 1000 in numerals and in words</p> <p>solve number problems and practical problems involving these ideas.</p>	<p>Starter activity for nice and nasty game <a href="https://nrich.maths.org/6605">https://nrich.maths.org/6605</a> Using dienes to represent and estimate numbers.</p> <p>Weekly Skills Checker Stage 3 – question 3.</p> <p>Reasoning and Problem-Solving integral part of teaching through Classroom Secrets. (graduated development from Autumn Block 1 Step 01 to Step 10 based on ability and progress). Developing understanding with <a href="http://media.wix.com/ugd/c415a5_34af0e9a6ae44cb9a1234129f9cbe73c.pdf">http://media.wix.com/ugd/c415a5_34af0e9a6ae44cb9a1234129f9cbe73c.pdf</a></p>
<p><b><u>Class 3 - Students will:</u></b> (if previous is secure)</p> <p><u>Year 4</u></p> <p>count in multiples of 6, 7, 9, 25 and 1000</p> <p>find 1000 more or less than a given number</p> <p>count backwards through zero to include negative numbers</p> <p>recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</p> <p>order and compare numbers beyond 1000</p> <p>identify, represent and estimate numbers using different representations</p>	<p><a href="#">Weekly Skills Checker Stage 4 Questions 1-5</a></p> <p>Big Maths Beat That project – sequential teaching of times-tables and key instant recall facts. (Introduced at school and secured as part of homework) Assessed through daily Big Maths Beat That. Countdown – to secure 25 times table</p> <p>1000 more or less than a given number activity. Some Games that might be nice or nasty – link: <a href="https://nrich.maths.org/6605">https://nrich.maths.org/6605</a> This is also used to secure place value of each digit</p> <p>Swimming pool steps – developing concept and ability to count through zero – link: <a href="https://nrich.maths.org/5836/note">https://nrich.maths.org/5836/note</a></p> <p>Different representations of numbers secured using physical apparatus and p.4/5 of I See Reasoning LKS2.</p>

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round any number to the nearest 10, 100 or 1000

solve number and practical problems that involve all of the above and with increasingly large positive numbers

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.

## Year 5

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.

Reasoned Rounding, to support rounding any number to nearest 10, 100 or 100 – link: <https://nrich.maths.org/10945>

Rounding - I See Reasoning LKS2 p.20-23 (problem-solving and reasoning activities that secure understanding of reasoning from 'explaining mistakes')

Roman Numerals – Introduced with Badger Learning programme and reinforced with I See Reasoning LKS2 p24-26.

## [Weekly Skills Checker Stage 5 Questions 1-4 & Stage 6 Questions 1 & 2](#)

Target Your Maths support activity (Year 5 & 6) – worksheet-based task to secure the reading, writing, ordering and comparing of numbers to 1,000,000 or 10,000,000 (Year 6) and counting forward and backwards in steps of powers of 10. Supporting by chanting exercise.

Negative numbers taught alongside scientific reading of temperature in States of Matter investigations, supported by p.13-15 of I See Reasoning UKS2

Rounding numbers taught through problem-solving activities from I See Reasoning UKS2 p.17-20.

Roman Numerals – Introduced with Badger Learning programme and reinforced with Roman Numeral anagrams and word play problem-solving activities.

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## Year 6

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.

### **IMPACT:**

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## Maths - addition and subtraction

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<b>Intent - What is taught? (Objectives)</b> <b>Beyond?</b>	<b>Implementation –</b> <b>When, How, Where and Why?</b>
<p><b><u>Class 1 - Year 1 Students will:</u></b> (if EYFS learning is secure)</p> <p>read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs</p> <p>represent and use number bonds and related subtraction facts within 20</p> <p>add and subtract one-digit and two-digit numbers to 20, including zero</p> <p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = ? - 9</math>.</p>	<p>During the starter activity for each day. We have 4 days – count it, times it, rehearse it, recall it.</p> <p>Woven throughout all of the maths learning we do across the year – LTP. This is continued on from EYFS using concrete methods such as counting groups of buttons and then counting them all together. This is then extended into a pictorial form using the part, part, whole method where children can replace their buttons with dots. We develop this further by replacing the dots with numerals and then writing these numerals into a sum. Children are introduced to the symbols + - and = through teacher modelling and add these to their maths working wall to develop their familiarity.</p> <p>Number Walls = children take these home and practise them in Sets of instant recall facts.</p> <p>Skills checkers is used to support and develop children - identifying any misconceptions. For example, if children have written 18 instead of 81, we will look at place value and the understanding of numbers to 100 using a 100 square. We can play games such as 'I am thinking of a number, it is 1 more than 80 and 1 less than 82, what is it?' to develop children's familiarity with numbers to 100.</p>



# Brompton & Sawdon CP Whole-School Maths Curriculum

Big maths, beat that

NRICH tasks – looking at problem solving activities

Eg - Tom is bowling, which pins must he knock down to score 7? How many ways can you do it?

Mastery – Using Carmel Archimedes for mastery and greater depth activities

Eg - Write the missing symbols in these number sentences. Test them to make sure they are correct.

+, - and =

• 7  2  9

• 8  4  4

NCETM – Activities from the Year 1 curriculum (and Year 2 where appropriate)

Eg - Harry had 6 marbles. His friend gave him 12 more. How many marbles does Harry have now?

Can the bar model help you?

$6 + 12$

6	12
?	

**Class 2 - Students will:** (if previous is secure)

Year 2

solve problems with addition and subtraction:

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- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods

recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

add and subtract numbers using concrete objects, pictorial representations, and mentally, including:

- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers

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

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

## Year 3

add and subtract numbers mentally, including:

- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds

Develop conceptual learning with visual stimulus, such as inter link blocks, Lego, Cuisenaire rods, dienes blocks, rulers and scales. Teaching with the use of number lines with jumps of ones and tens.

Big Maths Beat That to strengthen instant recall facts (without visual aids to improve and develop mental skills)

Use of visual/pictorial representation (number lines, drawing dots, counting pictures) and mental strategies (putting largest number in your head and counting on). Introduction of column addition and subtraction following securing place value, shown using concrete apparatus.

Maths games that evidence adding in either order (commutative) and that this does not work with subtracting.

<https://nrich.maths.org/6589>

Inverse operation taught and consolidated in weekly skills checker. Questions 8 - 10.

Big Maths Beat That used to develop mental methods and fluency.

Teaching of column addition and subtraction –supported with weekly skills checker and Big Maths Beat That. Questions 8 - 10

Weekly skills checker – Stage 3 questions 6-10

Inverse operation taught and consolidated in weekly skills checker.

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add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

estimate the answer to a calculation and use inverse operations to check answers

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

Reasoning and problem-solving integral part of teaching through Classroom Secrets (graduated development from Autumn Block 2 Step 01 to Step 15 based on ability and progress) and I See Reasoning (p 41 – 44).

## **Class 3 - Students will:** (if previous is secure)

### Year 4

add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate

estimate and use inverse operations to check answers to a calculation

solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

### [Weekly Skills Checker Stage 4 Questions 6-8](#)

Introduced and secured with worksheet-based task (Target Your Maths Year 4), supplemented by problem-solving activity, Two and Two (introducing notion of algebra) – link:

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

Answers to the above checked through using inverse operations.

Above learning secured through application to two-step problems, such as: Sealed Solution & Fifteen Cards – Link:

<https://nrich.maths.org/1177> <https://nrich.maths.org/7506>

### Year 5

add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)

### [Weekly Skills Checker Stage 5 Questions 5-7 & Stage 6 Questions 5-6](#)

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<p>add and subtract numbers mentally with increasingly large numbers</p> <p>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Introduced and secured with worksheet-based task (Target Your Maths Year 5 &amp; 6), supplemented by problem-solving activities, such as 'Broken Calculator' (I See Reasoning, p. 22-23)</p> <p>Answers to the above checked through using inverse operations and by rounding.</p> <p>Multi-step word problems sourced through Target Your Maths (Year 5 &amp; 6) to understand which operations and methods are most effective.</p>
<p><b><u>IMPACT:</u></b></p>	

### **Number – multiplication and division**

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<p style="text-align: center;"><b>Intent - What is taught? (Objectives)</b> <b>Beyond?</b></p>	<p style="text-align: center;"><b>Implementation –</b> <b>When, How, Where and Why?</b></p>
<p><b><u>Class 1 - Year 1 Students will:</u></b> (if EYFS learning is secure)</p> <p>solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.</p>	<p>iSEE Reasoning KS1 tasks</p> <p>The weekly skills checker is used effectively to address misconceptions during teacher time.</p> <p>Multiplication and division taught in blocks across the year - see the LTP.</p> <p>Children are given mental arithmetic questions before a numeracy input that includes ‘times it’ questions. <i>‘What is 1x2 Can you show me in cubes?’</i></p> <p>Children are modelled methods of multiplication that develops on from counting in multiples. <i>‘Count out groups of 10 from 2p, 5p or 10p coins’</i></p> <p>We use tens frames to model arrays and images that can be counted in multiples such as Cherries (counting 2 at a time).</p> <p>Children answer one-step problems such as <i>‘Share 12 sweets between 2 children, how many do they have each?’</i> using concrete objects, before moving onto pictorial methods and numeral representations as their skills develop.</p>
<p><b><u>Class 2 - Students will:</u></b> (if previous is secure)</p> <p><u>Year 2</u></p>	

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recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

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

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

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

## Year 3

recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

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

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.

Learning as part of daily warm up activity and games – Ninja maths, bingo. Understanding checked via Big Maths Beat That and Skills Checker. Sequential teaching of applicable times tables and using existing knowledge (e.g.  $3 \times 10 = 30$ , therefore  $3 \times 5 = 15$ ).

Weekly skills checker – Stage 2 questions 11-17

White Rose Hub activities – fluency, reasoning and problem-solving  
[http://media.wix.com/ugd/c415a5\\_f5fbd1ae9fb14316a255e06eee784754.pdf](http://media.wix.com/ugd/c415a5_f5fbd1ae9fb14316a255e06eee784754.pdf)

iSee Reasoning (p77 – 79 & p85 – 88) and Classroom Secrets (graduated development from Autumn Block 3 Step 01 to Step 15 and Spring Block 1 Step 01 to 08) based on ability and progress) activities to embed understanding.

Learning as part of daily warm up activity and games – Ninja maths, bingo. Understanding checked via Big Maths Beat That and Skills Checker. Sequential teaching of applicable times tables and using existing knowledge (e.g.  $3 \times 4 = 12$ , therefore  $3 \times 8 = 24$  – doubles and halves).

Strategies employed such as using repeated addition and subtraction.

Big Maths Beat That – Skills Checker Stage 3 questions 11-14.  
White Rose learning for fluency, reasoning and problem solving  
[http://media.wix.com/ugd/c415a5\\_baa330153317423cb31ba0bf74b65d74.pdf](http://media.wix.com/ugd/c415a5_baa330153317423cb31ba0bf74b65d74.pdf)

What's in The Box? activity <https://nrich.maths.org/5576>

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## Class 3 - Students will: (if previous is secure)

### Year 4

recall multiplication and division facts for multiplication tables up to  $12 \times 12$

use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers

recognise and use factor pairs and commutativity in mental calculations

multiply two-digit and three-digit numbers by a one-digit number using formal written layout

solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

### Year 5

identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers

know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers

### [Weekly Skills Checker Stage 4 Questions 9-12](#)

Big Maths Beat That project – sequential teaching of times-tables and key instant recall facts. (Introduced at school and secured as part of homework) Assessed through daily Big Maths Beat That.

Multiplying by 1 and 0 taught discretely and explained in ‘lots of’ terms.

Multiplying three digits together (and above) secured through problem-solving activity: <https://nrich.maths.org/5714>

Factor pairs, commutativity and distributive law taught alongside Big Maths scheme and as part of weekly Skills Checker Stage 4 Question 10 and secured through worksheet task (Target Your Maths 4)

Formal written layout for multiplication, introduced/secured with worksheet (Target Your Maths 4) and secured with problem-solving activity, which includes ‘unknowns’, All the Digits – link: <https://nrich.maths.org/1129>

### [Weekly Skills Checker Stage 5 Questions 8-12](#)

Multiples, factors and prime numbers/factors: Introduced using p.24-26 of Target Your Maths (Year 5)

Secured through problem-solving activities from I See Reasoning (p.35-38).

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establish whether a number up to 100 is prime and recall prime numbers up to 19

multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

multiply and divide numbers mentally drawing upon known facts

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

multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

recognise and use square numbers and cube numbers, and the notation for squared and cubed

solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes

solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign

100 square activity – linking to times tables (highlighting those numbers with only two factors) and secured with problem-solving activity: Two Primes make One Square <https://nrich.maths.org/1150> and Factor Track - <https://nrich.maths.org/7468>

Written methods Introduced alongside p.36/37 & p.41-43 of Target Your Maths (Year 5).

Secured/deepened learning through problem-solving:

All the Digits: <https://nrich.maths.org/1129>

Trebling: <https://nrich.maths.org/2004>

This also includes ‘missing number’ problems, to secure other ‘known facts’

For those very secure: Curious Number:

<https://nrich.maths.org/7218>

Taught alongside measurement unit (converting metric measures) to provide context.

Secured with I See Reasoning p.26 & 28, using ‘Explain the Error’ and ‘I Know, so...’ process.

Word problems to secure calculation method: p.50/51 of Target Your Maths Year 5.

See above from problems involving factors, multiples, squares and cubes. Also, used: ‘Odd Squares’ - <https://nrich.maths.org/2280> and ‘Always, Sometimes, Never’ - <https://nrich.maths.org/12672>



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solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

## Year 6

multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

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

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

perform mental calculations, including with mixed operations and large numbers

identify common factors, common multiples and prime numbers

use their knowledge of the order of operations to carry out calculations involving the four operations

solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

solve problems involving addition, subtraction, multiplication and division

## [Weekly Skills Checker Stage 6 Questions 3-5](#)

Introduced through worksheet (Target Your Maths 6, p.13,14, 17 & 18) with checking through rounding (p. 23)

Secured through missing number problems, e.g. I See Reasoning (p.33/34) & 'Explain the Mistake' & 'Rank by Difficulty' (p.37-40). The above also includes representing 'remainders' in different contexts and representing them through fractions, decimals or remainders (as appropriate).

Mental calculations (supported through Big Maths programme).

Problem-solving activity to secure: Make 100:

<https://nrich.maths.org/1013>

Secured through problem-solving activities from I See Reasoning (p.35-38) and secured with problem-solving activity: Two Primes make One Square <https://nrich.maths.org/1150> and Factor Track - <https://nrich.maths.org/7468>

See above from problems involving factors, multiples, squares and cubes. Also, used: 'Odd Squares' - <https://nrich.maths.org/2280> and 'Always, Sometimes, Never' - <https://nrich.maths.org/12672>

Introduction to BODMAS alongside algebra unit (representation of unknown integers through pictures), secured through worksheet (Target Your Maths 6 p.36)

Also taught through 'Explain Your Error', where calculations are solved from 'left to right' (and, thus, often wrong).

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use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	Multi-step problems taught through word problems (Target Your Maths 6, p. 38/39), where estimation is also used alongside (also reinforced, as stated above, alongside the teaching of each method of calculation.
<b><u>IMPACT:</u></b>	

### **Number – Fractions**

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<p style="text-align: center;"><b>Intent - What is taught? (Objectives)</b></p> <p style="text-align: center;"><b>Beyond?</b></p>	<p style="text-align: center;"><b>Implementation – When, How, Where and Why?</b></p>
<p><b><u>Class 1 - Year 1 Students will:</u></b> (if EYFS learning is secure)</p> <p>recognise, find and name a half as one of two equal parts of an object, shape or quantity</p> <p>recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</p>	<p>Fractions - taught in blocks across the year. LTP. Using playdough, shading shapes, cutting and folding shapes. Showing it with quantity - sharing the stars into groups of 2.</p> <p>Using other contexts such as lunch time - <i>can you cut your apple in half?</i></p>
<p><b><u>Class 2 - Students will:</u></b> (if previous is secure)</p> <p><u>Year 2</u></p> <p>recognise, find, name and write fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math>, and <math>\frac{3}{4}</math> of a length, shape, set of objects or quantity</p> <p>write simple fractions for example, <math>\frac{1}{2}</math> of <math>6 = 3</math> and recognise the equivalence of <math>\frac{2}{4}</math> and <math>\frac{1}{2}</math>.</p> <p><u>Year 3</u></p>	<p>Use of concrete, pictorial and abstract to embed the concept of fractions. Using resources such as pizza, fruit and cubes to show parts of a whole. <a href="https://nrich.maths.org/5590">https://nrich.maths.org/5590</a></p> <p>Developing the link between division and fractions. ISee Reasoning (p89 – 101) and Classroom Secrets activities. (graduated development from Spring Block 5 Step 01 to Step 14 based on ability and progress).</p>

# Brompton & Sawdon CP Whole-School Maths Curriculum

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

recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators

recognise and show, using diagrams, equivalent fractions with small denominators

add and subtract fractions with the same denominator within one whole [for example,  $5/7 + 1/7 = 6/7$ ]

compare and order unit fractions, and fractions with the same denominators

solve problems that involve all of the above.

Link fractions to the 10 x table and division.

Classroom Secret activities (graduated development from Spring Block 5 Step 01 to Step 14 based on ability and progress)

White Rose [http://media.wix.com/ugd/c415a5\\_8ed51023469e46a4a7e785732cd15d36.pdf](http://media.wix.com/ugd/c415a5_8ed51023469e46a4a7e785732cd15d36.pdf)

Use of manipulatives to demonstrate fractions and use of White Rose fluency, reasoning and problem-solving activities.

[http://media.wix.com/ugd/c415a5\\_79ef4ff81e804a3ea4e77b6f1e3e652c.pdf](http://media.wix.com/ugd/c415a5_79ef4ff81e804a3ea4e77b6f1e3e652c.pdf)

I See Reasoning (p75 – 77) and Classroom Secrets activities (graduated development from Spring Block 5 Step 01 to Step 14 based on ability and progress)

Fraction Match game <https://nrich.maths.org/6938>

Link times tables to equivalent fractions, supported by pictorial representations.

[http://media.wix.com/ugd/c415a5\\_3c30d175a3dd4fb29ac147833b8a1d64.pdf](http://media.wix.com/ugd/c415a5_3c30d175a3dd4fb29ac147833b8a1d64.pdf)

Skills Checker stage 3 question 19

Pictorial representations -

[http://media.wix.com/ugd/c415a5\\_97300c80c20f492292a50a6d55b453d1.pdf](http://media.wix.com/ugd/c415a5_97300c80c20f492292a50a6d55b453d1.pdf)

Problem solving activities from NRich, Classroom Secrets and White Rose.

[http://media.wix.com/ugd/c415a5\\_40cca63986154fa88c7ea6216a74311a.pdf](http://media.wix.com/ugd/c415a5_40cca63986154fa88c7ea6216a74311a.pdf)

# Brompton & Sawdon CP Whole-School Maths Curriculum

**Class 3 - Students will:** (if previous is secure)

Year 4

recognise and show, using diagrams, families of common equivalent fractions

count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.

recognise and write decimal equivalents of any number of tenths or hundredths

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

add and subtract fractions with the same denominator

[Weekly Skills Checker Stage 4 Questions 13-18](#)

Fraction wall – introduction to visual representation of equivalent fractions: <https://nrich.maths.org/4519>

This is supported through Fractional Triangles: <https://nrich.maths.org/2124> to demonstrate a different medium of representing equivalent fractions.

Taught alongside money unit (explanation of decimal representation of denominations of money and how this would be shown on a till). Chanting and missing number problems (from an adapted '100 square' to support)

Various problem-solving activities used to support this, where fractions are demonstrated through different visual and concrete representations (I See Reasoning, p.44-52)

Taught as part of weekly skills check and support through visual representation, e.g. 'Chocolate' problem-solving activity: <https://nrich.maths.org/34>

# Brompton & Sawdon CP Whole-School Maths Curriculum

recognise and write decimal equivalents to  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$

find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

round decimals with one decimal place to the nearest whole number

compare numbers with the same number of decimal places up to two decimal places

solve simple measure and money problems involving fractions and decimals to two decimal places.

## Year 5

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

Dividing 1 series of sessions, taught alongside short division method, to demonstrate what happens when numbers do not divide exactly or when numbers are dividing by a number greater than itself.

Taught alongside measurement unit (as referred to in Multiplication & Division) and alongside money representation (as above).

The adjacent is taught alongside the above learning activities (e.g. rounding to the nearest pound or calculation change).

This is secured through: p.89-93 (I See Reasoning) and p.76, 79-81 Target Your Maths Year 4.

## [Weekly Skills Checker Stage 5 Questions 13-19](#)

Taught through weekly skills checker and reinforced through different representations (e.g. visual/concrete – cake or abstract – test scores)

Securing of this through ‘Tumbling Fractions’ activity:

<https://nrich.maths.org/13728> and through worksheet-based task (Target Your Maths Year 5 p.53-55)

## Brompton & Sawdon CP Whole-School Maths Curriculum

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,  $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$ ]

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,  $0.71 = 71/100$ ]

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

Introduced through Reasoning problem: I See Reasoning (p.49) and secured through p.53 (Rank by Difficulty) which focuses on the difference between proper/improper fractions, as well as add/subtracting fractions with the same denominator.

Add/Subtracting fractions with same denominator taught through p. 87/88 of I See Reasoning. Different denominators of same multiple - <https://nrich.maths.org/1103>

Taught through 'Explain the Mistake' & 'Rank by Difficulty' (I See Reasoning, p. 55/56) and supported through visual representation and worksheet-based task (p.63 Target Your Maths 5)

Taught alongside money unit and multiplication (as stated above)

Developed alongside teaching of tenths, hundredths (as above) – used alongside Olympics series of lessons (timings for events).

Secured alongside teaching of decimals, tenths, hundredths and thousandths alongside worksheet task: p. 68/69 of Target Your Maths (Year 5).

Through French and Skills Checker – representing fractions as hundredths and as decimals. Secured through Hundred Square activity (alongside Target Your Maths Year 5, p. 80)

# Brompton & Sawdon CP Whole-School Maths Curriculum

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.

## Year 6

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

This is secured through problem-solving activities (Different Ways – I See Reasoning, p. 61)

## [Weekly Skills Checker Stage 6 Questions 7-12](#)

Taught alongside common multiples/factors (multiplication and division), secured through activities, such as 'Venn Diagram' (I See Reasoning p.48) and comparing/ordering fractions (Target Your Maths, Year 6 – p.43)

This above is secured through the teaching of add/subtracting fractions, using, where appropriate, open-ended tasks, such as I See Reasoning p.54.



## Brompton & Sawdon CP Whole-School Maths Curriculum

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

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

Visual representation to ensure understanding. This is shown p.57 of I See Reasoning

Taught through I See Reasoning p.58 (Rank by Difficulty and I Know, so... activities). Also reinforced through dividing fractions 'poem'.

Dividing 1 series of lessons, taught alongside division to help understand numbers that are not whole or what happens when dividing a number by a divisor greater than itself.

Taught alongside place value unit and measurement. Also, secured through money unit (as demonstrated above).

Taught as part of multiplication and division unit (written methods) Secured with activities, such as Route Product: <https://nrich.maths.org/5632>

Taught alongside the above (and other units of work). Secured through activities, such as: (Doughnut Percents) <https://nrich.maths.org/6945>

# Brompton & Sawdon CP Whole-School Maths Curriculum

recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.	
<b><u>IMPACT:</u></b>	

## Measurement

# Brompton & Sawdon CP Whole-School Maths Curriculum

<p><b>Intent - What is taught? (Objectives)</b> <b>Beyond?</b></p>	<p><b>Implementation –</b> <b>When, How, Where and Why?</b></p>
<p><b><u>Class 1 - Year 1 Students will:</u></b> (if EYFS learning is secure)</p> <p>compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> <li>• lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]</li> <li>• mass/weight [for example, heavy/light, heavier than, lighter than]</li> <li>• capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]</li> <li>• time [for example, quicker, slower, earlier, later]</li> </ul> <p>measure and begin to record the following:</p> <ul style="list-style-type: none"> <li>• lengths and heights</li> <li>• mass/weight</li> <li>• capacity and volume</li> <li>• time (hours, minutes, seconds)</li> </ul> <p>recognise and know the value of different denominations of coins and notes</p> <p>sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p>	<p>Measures - taught through the year in blocks and where possible this will link into our topic work. For example - during Fairytales and Castles, the children were given the task: <i>We are making a castle in the class - we need to make sure that our walls are tall enough to protect us!</i> <i>How tall are we? - Chn to measure their height and each other.</i> <i>Chn to order themselves in height order.</i></p> <p>Design and technology - food and nutrition - baking cookies. Cooking soup.</p> <p>Topic - Solar System. The year, months, days, 24 hours.</p> <p>iSee Reasoning - comparing and discussing practical problems.</p> <p>Cultural capital opportunities - Fundraising bake sale for the Mountain Rescue Team. Selling cakes and giving change.</p> <p>Daily discussions of the day, date etc at the morning register.</p> <p>Birthday celebrations and traditional celebrations - raising awareness of months, time etc.</p> <p>Following daily timetables that familiarise children with the time of day.</p>

# Brompton & Sawdon CP Whole-School Maths Curriculum

<p>recognise and use language relating to dates, including days of the week, weeks, months and years</p> <p>tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</p>	<p>We support children to identify the time or measuring of time throughout the school day, as well as outside of school hours.</p> <p>Children are given questions that allow them to relate time to things that are familiar to them, such as:</p> <p><i>What happens first?</i>  <i>I go to school</i>  <i>I eat breakfast</i>  <i>I go to bed</i></p>
<p><b><u>Class 2 - Students will:</u></b> (if previous is secure)</p> <p><u>Year 2</u></p> <p>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</p> <p>compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =</p> <p>recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</p> <p>find different combinations of coins that equal the same amounts of money</p>	<p><u>Weekly Skills Checker Stage 2 – questions 21 - 23</u></p> <p>Teaching the use of manipulatives – rulers, scales, jugs. Units of measurement and applicable to real life situations.</p> <p>Little Man activity: <a href="https://nrich.maths.org/4789">https://nrich.maths.org/4789</a></p> <p><a href="http://media.wix.com/ugd/c415a5_263bf96469ef40078e78c6f79a73f4f1.pdf">http://media.wix.com/ugd/c415a5_263bf96469ef40078e78c6f79a73f4f1.pdf</a> activity.</p> <p>ISee Reasoning (p102 – 121) and Classroom Secrets activities (graduated development from Summer Block 4 Step 01 to Step 09 based on ability and progress).</p> <p>Sort money into relevant denominations, distinguish which coins are available and what coins make £1. Pictorial representations are shown around the classroom – children calculate amounts from different coins.</p> <p>Cross curricular – DT buying materials to make a bridge.  The Puzzling Sweet Shop activity <a href="https://nrich.maths.org/223">https://nrich.maths.org/223</a></p>

# Brompton & Sawdon CP Whole-School Maths Curriculum

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

compare and sequence intervals of time

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

know the number of minutes in an hour and the number of hours in a day

## Year 3

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

measure the perimeter of simple 2-D shapes

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

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

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

Use of manipulatives, children to show different times – teaching of past and to,  $\frac{1}{4}$  and  $\frac{1}{2}$  relating to fractions learning.

Classroom Secrets activities (graduated development from Summer Block 3 Step 01 to Step 10 based on ability and progress)

Stop the Clock activity <https://nrich.maths.org/6071>

What's the Time <https://nrich.maths.org/7377>

Matching Time game <https://nrich.maths.org/10332>

Weekly Skills Checker Stage 3 – questions 21 – 24.

Physical measurement with use of rulers, scales and jugs and comparing the difference between units of measurement and their relative size. Taught alongside calculation units.

Taught using manipulatives and measuring perimeter of real-life areas – e.g. the perimeter of the playground with a trundle wheel.

Use of manipulatives, creating virtual shops and activities to give change.

Puzzling Sweet Shop Game <https://nrich.maths.org/223>

Various time activities including using movable clocks, exercises with Roman numeral clocks and both 12 and 24 hours times.

<https://nrich.maths.org/1981>

Using fluency, reasoning and problem-solving techniques, developed with White Rose assessment.

[http://media.wix.com/ugd/c415a5\\_94e57e1571df4df98b76f4eaba53e07a.pdf](http://media.wix.com/ugd/c415a5_94e57e1571df4df98b76f4eaba53e07a.pdf)

Watch the Clock <https://nrich.maths.org/980>

## Brompton & Sawdon CP Whole-School Maths Curriculum

<p>o'clock, a.m./p.m., morning, afternoon, noon and midnight</p> <p>know the number of seconds in a minute and the number of days in each month, year and leap year</p> <p>compare durations of events [for example to calculate the time taken by particular events or tasks].</p>	<p>Teaching by rote – assessed</p> <p><a href="http://media.wix.com/ugd/c415a5_88247187497248729cc46a27ccb5b353.pdf">http://media.wix.com/ugd/c415a5_88247187497248729cc46a27ccb5b353.pdf</a></p>
<p><b><u>Class 3 - Students will:</u></b> (if previous is secure)</p> <p><u>Year 4</u></p> <p>Convert between different units of measure [for example, kilometre to metre; hour to minute]</p> <p>measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>find the area of rectilinear shapes by counting squares</p> <p>estimate, compare and calculate different measures, including money in pounds and pence</p> <p>read, write and convert time between analogue and digital 12- and 24-hour clocks</p>	<p><a href="#"><u>Weekly Skills Checker Stage 4 Questions 19-22</u></a></p> <p>Introduced through physical measurement, to understand the difference between relative sizes and units of measure. Secured through problem-solving activities, such as p. 94-96 of I See Reasoning (activities: Explain, True or False and Rank by Difficulty) to increase understanding of conversion and equivalent measurements.</p> <p>Taught alongside I See Reasoning problem-solving activities (p.105-110), to understand the difference and relationship between area and perimeter. Further secured, alongside problem-solving activity: Numerically Equal - <a href="https://nrich.maths.org/1045">https://nrich.maths.org/1045</a></p> <p>Taught alongside calculation units (see above).</p> <p>Taught through timetable activities (e.g. Target Your Maths Year 4 p.104) and through problem solving activities, such as How Many Times? :</p>

# Brompton & Sawdon CP Whole-School Maths Curriculum

solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

## Year 5

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<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes

<https://nrich.maths.org/981>; 5 on the Clock: <https://nrich.maths.org/1981> and Wonky Watches: <https://nrich.maths.org/1002>

## [Weekly Skills Checker Stage 4 Questions 20-23](#)

Introduced through physical measurement, to understand the difference between relative sizes and units of measure. Secured through problem-solving activities, such as p. 66 of I See Reasoning (activities: Explain the mistakes and Rank by Difficulty) to increase understanding of conversion and equivalent measurements.

Introduced with historical context and worksheet-based task (Target Your Maths 5, p. 84) and secured through problem-solving activity: p.66-68 (I See Reasoning).

Securing of understanding of area and perimeter before using this knowledge to understand composite shapes through reasoning activities (p.72-75) and 'Area and Perimeter' - <https://nrich.maths.org/7280> and Through the Window: <https://nrich.maths.org/10344>

Introduced alongside cube apparatus and worksheet-based task – p.98 (Target Your Maths 5) and secured with 'Making Boxes' problem-solving task: <https://nrich.maths.org/89>

# Brompton & Sawdon CP Whole-School Maths Curriculum

estimate volume [for example, using 1 cm<sup>3</sup> 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.

## Year 6

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

Secured alongside above learning and that from other units

## [Weekly Skills Checker Stage 4 Questions 18-22](#)

Introduced through physical measurement, to understand the difference between relative sizes and units of measure. Secured through problem-solving activities, such as p. 66 of I See Reasoning (activities: Explain the mistakes and Rank by Difficulty) to increase understanding of conversion and equivalent measurements.

Introduced with historical context and worksheet-based task (Target Your Maths 5, p. 84) and secured through problem-solving activity: p.66-68 (I See Reasoning).

Introduced through 'Area and Perimeter' - <https://nrich.maths.org/7280> and secured through activity: p.75 I See Reasoning.



## Brompton & Sawdon CP Whole-School Maths Curriculum

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 ( $\text{cm}^3$ ) and cubic metres ( $\text{m}^3$ ), and extending to other units [for example,  $\text{mm}^3$  and  $\text{km}^3$ ].

**IMPACT:**

Formulae taught alongside relevant units that investigate polygons whose area and volume can be calculated. Supported through worksheet-based task (Target Your Maths 6, p. 100-102) and through Next Size Up physical problem-solving activity (volume).

# **Brompton & Sawdon CP Whole-School Maths Curriculum**

**Geometry – properties of shapes, position and direction**

# Brompton & Sawdon CP Whole-School Maths Curriculum

<p><b>Intent - What is taught? (Objectives)</b> <b>Beyond?</b></p>	<p><b>When, How, Where and Why?</b> <b>Implementation –</b></p>
<p><b><u>Class 1 - Year 1 Students will:</u></b> (if EYFS learning is secure)</p> <p>recognise and name common 2-D and 3-D shapes, including:</p> <ul style="list-style-type: none"> <li>• 2-D shapes [for example, rectangles (including squares), circles and triangles]</li> <li>• 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].</li> </ul> <p>describe position, direction and movement, including whole, half, quarter and three-quarter turns.</p>	<p>Geometry - taught in blocks across the year - LTP. Children are given opportunities to explore shapes and develop a deeper understanding of their properties. For example, children use shape tiles to recreate Tangram designs or Tessellation patterns, including snowmen and Christmas presents during December.</p> <p>Children have access to shape resources at all times, including shape bean bags, large wooden stencil shapes, tessellation tiles, 3D shapes and 3D nets. We play games such as <i>'In my bag I can feel a shape, it has 4 corners... what do you think it could be?'</i></p> <p>We also extend children's thinking by asking questions such as - <i>'Why can't it be a triangle?'</i></p> <p>Art and design - use of shape and space for patterns, artwork and expressive design.</p> <p>Children develop positional language and direction/turns during computing - for example, children created a superhero board game using a 100 square grid. They made up algorithms to direct their lego man to safety using turns and movement. <i>'Forward 1, turn left, forward 2'</i>.</p> <p>PE - Children use language to describe position and turns during games.</p> <p>Prepositional language is used throughout the day - for example during line up time, sitting on the carpet etc.</p>
<p><b><u>Class 2 - Students will:</u></b> (if previous is secure)</p>	

# Brompton & Sawdon CP Whole-School Maths Curriculum

## Year 2

identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line

identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces

identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]

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

order and arrange combinations of mathematical objects in patterns and sequences

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 anticlockwise).

## Year 3

### Weekly Skills Checker Stage 2 – questions 22 – 23.

Introduced using manipulatives and pictorial representations – shapes in a feely bag, counting sides and teaching by rote the number of sides on 2D shapes. Making shapes on a peg board. Shape treasure hunt around the school.

Complete the Square <https://nrich.maths.org/2910>

Colour the Triangle <https://nrich.maths.org/171>

Introduced using manipulatives and pictorial representations – shapes in a feely bag, counting edges, vertices and faces and teaching by rote the properties of 3D shapes.

Shadow Play <https://nrich.maths.org/2350>

Challenge fluency, reasoning and problem solving -

[http://media.wix.com/ugd/c415a5\\_887fb52bca4a42eaa0e25bd4a37b3f45.pdf](http://media.wix.com/ugd/c415a5_887fb52bca4a42eaa0e25bd4a37b3f45.pdf)

Use of Always, Sometimes or Never questioning.

Use of manipulatives to create a pattern

[http://media.wix.com/ugd/c415a5\\_887fb52bca4a42eaa0e25bd4a37b3f45.pdf](http://media.wix.com/ugd/c415a5_887fb52bca4a42eaa0e25bd4a37b3f45.pdf)

Recognise whole, half and quarter turns linked to teaching of fractions.

Describe turns and give and follow instructions to turn. Give instructions to a friend to follow a route around the playground using the language of angles (acute, obtuse, right-angle).

# Brompton & Sawdon CP Whole-School Maths Curriculum

draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

recognise angles as a property of shape or a description of a turn

identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle

identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

**Class 3 Students will:** (if previous is secure)

Year 4

compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes

identify acute and obtuse angles and compare and order angles up to two right angles by size

Weekly Skills Checker Stage 3 - questions 22 –23

Use of manipulatives to demonstrate 2D and 3D shapes, treasure hunt around school for different 2D and 3D shapes, identifying different views of the shapes.

Overlapping <https://nrich.maths.org/5819/index>

Overlapping Again <https://nrich.maths.org/5820>

A puzzling Cube <https://nrich.maths.org/1140>

Using fluency, reasoning and problem solving with

[http://media.wix.com/ugd/c415a5\\_eb3c2f140e6b4a02b3cda320896fbca0.pdf](http://media.wix.com/ugd/c415a5_eb3c2f140e6b4a02b3cda320896fbca0.pdf)

Teaching of acute, obtuse and right angles – linking to fractions teaching.

[http://media.wix.com/ugd/c415a5\\_06e8e1f3b47749c4ad278201e2e61638.pdf](http://media.wix.com/ugd/c415a5_06e8e1f3b47749c4ad278201e2e61638.pdf)

Identifying parallel and perpendicular lines in everyday life, and describing which lines are vertical and horizontal – comparing horizontal to the horizon.

Weekly Skills Checker Stage 4 Questions 23-28

Odd One Out – I See Reasoning (p.111) – determining shapes' properties as a means to identify them as an odd one out in a given set. Secured with p.110-113 Target Your Maths 4 (quadrilaterals and triangles), securing understanding of properties of these polygons.

Introduced through 'tape on the table' task or 'arm angles' physical activity. Secured with p.118 of Target Your Maths 4 and through problem-solving activity – 112/113 & 114/115

# Brompton & Sawdon CP Whole-School Maths Curriculum

identify lines of symmetry in 2-D shapes presented in different orientations

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

describe positions on a 2-D grid as coordinates in the first quadrant

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

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

## Year 5

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

Symmetry Challenge - <https://nrich.maths.org/1886>

Stringy Quads - <https://nrich.maths.org/2913> (physical problem-solving activity)

Let us Reflect - <https://nrich.maths.org/1873>

Secured with p.116 of Target Your Maths 4

Introduced through Computing activity: Find the Robber (differentiated for each year group's objective): <https://nrich.maths.org/10736>

Eight Hidden Squares (finding squares on a co-ordinate grid)

<https://nrich.maths.org/6280>

Further secured through 'Explain the Mistakes' (I See Reasoning – p.118-120)

Translations taught through worksheet-based task (p.123 of Target Your Maths 4)

## Weekly Skills Checker Stage 5 Questions 24-28

Introduced through reasoning activity: 'Different Ways' and 'It is correct?' (I See Reasoning p.80), secured through worksheet-based task, p.122 (Target Your Maths 5)

Estimating angles interactive Computing activity: <https://nrich.maths.org/1235> which introduces the concept of comparing different types of angles and measurement in degrees.

# Brompton & Sawdon CP Whole-School Maths Curriculum

draw given angles, and measure them in degrees

identify:

- angles at a point and one whole turn (total  $360^\circ$ )
- angles at a point on a straight line and  $\frac{1}{2}$  a turn (total  $180^\circ$ )
- other multiples of  $90^\circ$

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.

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.

Year 6

draw 2-D shapes using given dimensions and angles

Secured through 'Explain the Mistake' task (I See Reasoning, p.85) and through drawing angles task (Target Your Maths 5 p.122)

Angles at a point is secured through I See Reasoning p.84.

Taught as part of area and perimeter aspects of learning related to composite shapes (See Measurement).

Common Core worksheet task – irregular and regular shape concept taught. Supported through other problem-solving activities, such as I See Reasoning p.77.

Taught through worksheet-based task (Target Your Maths 5, p. 125 & 129) and secured through problem-solving activity: Transformations on a Pegboard - <https://nrich.maths.org/1813>

[Weekly Skills Checker Stage 6 Questions 23-26](#)

Drawing and building shapes (2d and 3d) is conducted through tasks outlined in Target Your Maths 6, p.120 & 126. This incorporates making nets. The concept of nets is secured through problem-solving activity (I See Reasoning, p. 80 – Different Ways) and Cut Nets - <https://nrich.maths.org/2315>

## Brompton & Sawdon CP Whole-School Maths Curriculum

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.

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.

Taught through problem-solving and reasoning series of sessions (I See Reasoning, p. 77-79) and problem-solving activity: Always, Sometimes, Never Shape - <https://nrich.maths.org/12673>

Taught alongside Pie Charts unit (use of compass and protractor). Secured with Circles activity (p. 128 of Target Your Maths 6).

Introduced with p. 114/115 of Target Your Maths 6. Secured through problem-solving activities p.82-85 (I See Reasoning).

Introduced through Computing activity: Find the Robber (differentiated for each year group's objective): <https://nrich.maths.org/10736> secured through Co-ordinate dot-to-dot series of sessions.

Taught through worksheet-based task (Target Your Maths 6, p. 132 & 134) and secured through problem-solving activity: Transformations on a Pegboard - <https://nrich.maths.org/1813> and 'Ten Hidden Squares' activity <https://nrich.maths.org/2654>



# Brompton & Sawdon CP Whole-School Maths Curriculum

**IMPACT:**

**Statistics**

# Brompton & Sawdon CP Whole-School Maths Curriculum

<b>Intent - What is taught? (Objectives)</b> <b>Beyond?</b>	<b>When, How, Where and Why?</b> <b>Implementation –</b>
<p><b><u>Class 2 - Students will:</u></b> (if previous is secure)</p> <p><u>Year 2</u></p> <p>interpret and construct simple pictograms, tally charts, block diagrams and simple tables</p> <p>ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>ask and answer questions about totalling and comparing categorical data</p> <p><u>Year 3</u></p> <p>interpret and present data using bar charts, pictograms and tables</p> <p>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.</p>	<p><u>Weekly Skills Checker Stage 2 questions 24 – 25</u></p> <p>Conduct surveys to collate data (children's meal selection, favourite colours etc.) and then transfer information into simple pictograms, tally charts, block diagrams and simple tables.  <a href="http://media.wix.com/ugd/c415a5_1ace1c7fd0eb4ab9a389fe46e19c4700.pdf">http://media.wix.com/ugd/c415a5_1ace1c7fd0eb4ab9a389fe46e19c4700.pdf</a></p> <p>Use of iSee Reasoning (p133 – 136) and Classroom Secrets to evidence understanding of data and its collation (graduated development from Spring Block 3 Step 01 to Step 6 based on ability and progress).            If the World Were a Village <a href="https://nrich.maths.org/7725">https://nrich.maths.org/7725</a></p> <p><u>Weekly Skills Checker Stage 3 questions 24 – 25</u></p> <p>Conduct school-based surveys to present and interpret data. Use <a href="http://media.wix.com/ugd/c415a5_a85cddebd1b24b219748d24f43c15136.pdf">http://media.wix.com/ugd/c415a5_a85cddebd1b24b219748d24f43c15136.pdf</a></p> <p>Use more complex information (more than 1 per symbol) to enable understanding.            Use <a href="http://media.wix.com/ugd/c415a5_1849f9d6673a48448998a1652b0f1bfd.pdf">http://media.wix.com/ugd/c415a5_1849f9d6673a48448998a1652b0f1bfd.pdf</a></p>

# Brompton & Sawdon CP Whole-School Maths Curriculum

## Class 3 Students will: (if previous is secure)

### Year 4

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

solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

### Year 5

solve comparison, sum and difference problems using information presented in a line graph

complete, read and interpret information in tables, including timetables

### Year 6

interpret and construct pie charts and line graphs and use these to solve problems

### [Weekly Skills Checker Stage 4 Questions 29-30](#)

The following is typically complemented by student's own investigations required data collection (e.g. in science sessions, such as comparing different animals' gestation periods) and through presentation using ICT.

Secured through p.124, 126 & 132 of Target Your Maths 4 and I See Reasoning p.121-127 (variety of problem-solving activities to ensure consolidation of modes of presenting and interpreting data).

Problem-solving activity to secure understanding of Venn Diagrams – 'Plants' - <https://nrich.maths.org/36>

### [Weekly Skills Checker Stage 5 Questions 29-30](#)

The following is typically complemented by student's own investigations required data collection (e.g. in science sessions, such as comparing different animals' gestation periods) and through presentation using ICT.

Secured through p.132 & 138 of Target Your Maths 5 and I See Reasoning p. 89 & 91.

Timetables secured through problem-solving activity – 'Explain' p. 92 (I See Reasoning) and worksheet-based task (Target Your Maths, p. 142)

### [Weekly Skills Checker Stage 6 Questions 29-30](#)

The following is typically complemented by student's own investigations required data collection (e.g. in science sessions, such as comparing different animals' gestation periods) and through presentation using ICT.

# Brompton & Sawdon CP Whole-School Maths Curriculum

calculate and interpret the mean as an average.

## Ratio and Proportion (Year 6)

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 unequal sharing and grouping using knowledge of fractions and multiples

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

## Algebra

use simple formulae

Pie charts taught alongside unit on Geometry (Circles) incl. introduction to compass and protractor use for drawing circles. Supported with problem-solving – Match the Matches - <https://nrich.maths.org/4937>

Finding the mean – introduced through worksheet-based task (Target Your Maths, p. 150/151). Supported through weekly calculation of ‘Dojo’ team scores and ‘Big Maths’ score.

[Weekly Skills Checker Stage 6 Questions 13-14](#)

Introduced through problem-solving activity ‘Mixing Lemonade’ - <https://nrich.maths.org/6870> and secured through ‘recipe’ conversion tasks, e.g. Pumpkin Pie Problem - <https://nrich.maths.org/6870>

Taught alongside Fractions and Decimals units (incl.  $1/10^{\text{th}}$  and  $1/100^{\text{th}}$ ). Secured through problem-solving activities, such as ‘Would you Rather?’ - <https://nrich.maths.org/1118>

Scale Factor introduced through worksheet-based task – p. 74-76 and secured through I See Reasoning task (p.59-61 – ‘Which Picture?’ and ‘Different Ways’.

[Weekly Skills Checker Stage 4 Questions 15-17](#)

## Brompton & Sawdon CP Whole-School Maths Curriculum

<p>generate and describe linear number sequences</p> <p>express missing number problems algebraically</p> <p>find pairs of numbers that satisfy an equation with two unknowns</p> <p>enumerate possibilities of combinations of two variables</p>	<p>Algebra Project Book used to introduce students (even prior to Year 6) to the concept of representing unknowns in an equation (e.g. through inverse operations). Introduced through 'picture-based' unknown approaches.</p> <p>Algebra also secured through other units of work, e.g. addition and subtraction – 'Two and Two' - <a href="https://nrich.maths.org/twoandtwo">https://nrich.maths.org/twoandtwo</a> and 'Arithmagons'.</p> <p>Other problem-solving and reasoning activities to support equations with multiple variables or unknowns include: Different Deductions - <a href="https://nrich.maths.org/14164">https://nrich.maths.org/14164</a> and p. 62-65 of I See Reasoning.</p>
<p><b><u>IMPACT:</u></b></p>	