



# Maths at Peters Hill

RESEARCH

# Summary of Ofsted research review



## MATHS RESEARCH SUMMARY FOR PRIMARY LEADERS AND TEACHERS

(Based on Ofsted's Report)



Children need to be taught **different** types of **knowledge** in which they should become fluent. This **fluency** relates to recalling, using and applying their understanding as well as fluency in explaining **relationships**, principles and conditions for use.



**Declarative knowledge** can be introduced with "I know that..." and is related to facts and formula. **Procedural knowledge** can be introduced with "I know how..." and relates to methods. **Conditional knowledge** can be introduced with "I know when..." and relates to reasoning and problem solving strategies.



The **curriculum** should be **organised** and **sequenced** so that children can master the key foundational knowledge. Careful sequencing helps children appreciate and learn from new and consistent patterns in maths. The curriculum should **guarantee** long-term learning for **all children**.



Pupils should become proficient in core knowledge which can be recalled with speed and accuracy. This includes number facts, number bonds, multiplication facts, as well as relationships and laws e.g. the commutative law.



By breaking down knowledge into smaller components, teachers can develop pupils' automaticity and reduce the risk of overloading their working memory. Rehearsal of key content and the steps of composite skills improves the chances that pupils will acquire methods and strategies successfully.



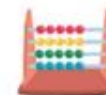
It is important for children in the EYFS to achieve fluency with basic number facts. Alongside the rich experiences which foster and develop mathematical thinking, it is important that children gain fluency with basic facts. Time will need to be spent on teaching the 'code' of maths, just like in English.



Explicit instruction is one effective method for teaching all groups of pupils, and stronger pupils can benefit from increased variation in additional intelligent practice, rather than moving on faster.



Pupils should have efficient, accurate and clear methods for the four operations. It is also equally important for them to present written methods neatly and logically, so to reduce the risk of accidental errors.



**Scaffolding** is essential but should be carefully considered so that children do not become dependent on them. **Manipulatives should be** used to reveal useful information but can be less effective when used as an external memory device.



Problem solving is **not** a generic skill that can be learned out of context. Problem solving should be taught alongside the curriculum content so that children can develop their conceptual understanding.



Frequent low-stakes testing can have a positive impact on memorisation, but the low-stakes element is key. Over-using past papers should be avoided as they can emphasise to learners what they do not know, rather than reinforcing what they do.



Practice is essential for procedural tasks. Regular rehearsal prevents children from forgetting what they have learned. It is important to plan for retrieval of facts, procedures and concepts.

### IMPLICATIONS FOR LEADERS

1. Be ambitious and expect all pupils to be successful.
2. Ensure sufficient, dedicated time for maths.
3. Ensure that bookwork is of a high quality.
4. Methods and presentation rules should be taught and rehearsed to automaticity.
5. Problem solving needs to be taught explicitly to all learners.
6. Support novice teachers to teach maths effectively by providing robust support: do not leave them to develop their own ways of teaching from scratch.
7. Have systematic plans to build models of instruction and rehearsal over time.
8. Teachers across phases benefit from renewing and improving their subject knowledge.

### Important Note:

There is significant disagreement by EYFS and Maths specialists and academics with some of the report's conclusions. The report makes these based on the studies the authors have considered, which might contradict findings from other research and theories, and with people's experience within the field of EYFS and maths education.

For a more detailed summary, check out my blog post at [www.marcchayes.com](http://www.marcchayes.com)

 @mrmarchayes

# Curriculum Content:

**Declarative knowledge** is static in nature and consists of facts, formulae, concepts, principles and rules.

- All content in this category can be prefaced with the sentence stem ‘I know that’.

**Procedural knowledge** is recalled as a sequence of steps. The category includes methods, algorithms and procedures: everything from long division, ways of setting out calculations in workbooks to the familiar step-by-step approaches to solving quadratic equations.

- All content in this category can be prefaced by the sentence stem ‘I know how’.

**Conditional knowledge** gives pupils the ability to reason and solve problems. Useful combinations of declarative and procedural knowledge are transformed into strategies when pupils learn to match the problem types that they can be used for.

- All content in this category can be prefaced by the sentence stem ‘I know when’.



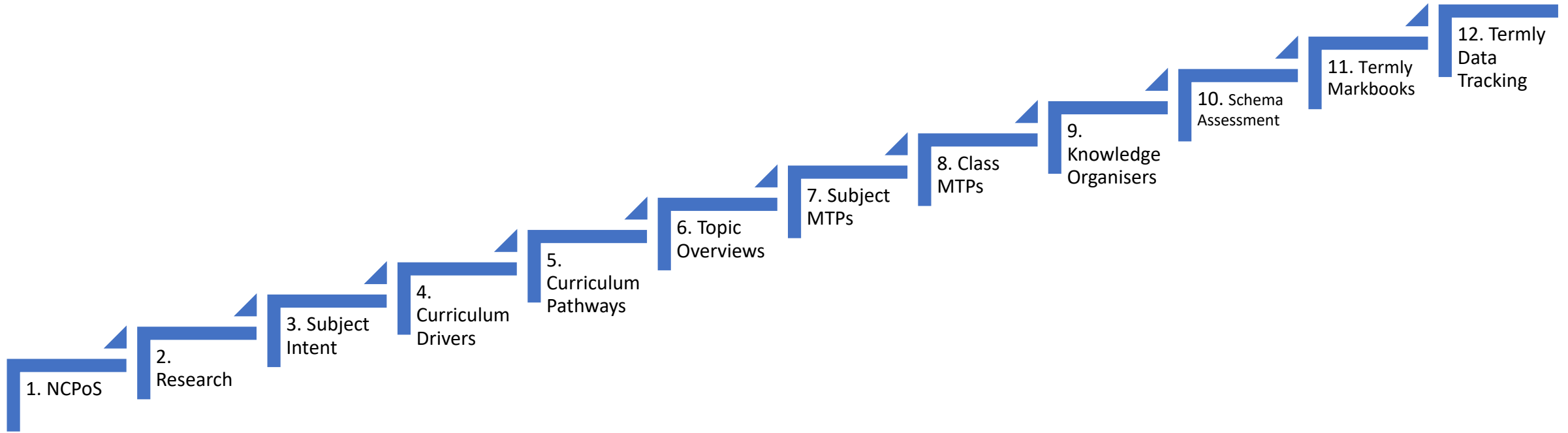
When pupils learn and use declarative, procedural and conditional knowledge, their knowledge of relationships between concepts develops over time. This knowledge is classified within the 'type 2' sub-category of content.

Category	Type 1	Type 2
<b>Declarative</b> <b>'I know that'</b>	Facts and formulae	Relationship between facts (conceptual understanding)
<b>Procedural</b> <b>'I know how'</b>	Methods	Relationship between facts, procedures and missing facts (principles/mechanisms)
<b>Conditional</b> <b>'I know when'</b>	Strategies	Relationship between information, strategies and missing information (reasoning)

# Our Process

# The Process at Peters Hill

## Our 12 step approach





INTENT

# At Peters Hill, our Maths Curriculum strives towards the following aims:

- To ensure that topics are broken down into manageable steps that build on a sequence of learning where mathematical concepts are connected and extended.
- To develop a depth of understanding across a range of concepts, continually challenging learning and enriching their experiences by making links across the curriculum,
- To adopt a mastery approach, spending time on topics in order to embed understanding and develop connections across them.
- A focus on the ability to calculate both mentally and in written form and to continue revisiting and consolidating these skills in order to commit them to long term memory.
- The curriculum will have regular repetition so a significant amount of lesson content is drawn from previously linked learning and then referred to when a new idea is introduced.
- Teaching will ensure that pupils will have the necessary appropriate knowledge of facts, concepts and procedures required to solve associated mathematical problems and reasoning activities of a more complex nature as well as linking with real-life situations.
- Gaps in learning will be identified and addressed quickly when they prevent a pupil from tackling more complex mathematical concepts.
- Children will explore maths and present their findings not only in a written form but also visually; to that end teachers will adopt the CPA approach: concrete, pictorial, abstract to broaden their knowledge and understanding.
- Children will have an extensive knowledge of subject vocabulary and will have confidence to use this in order to communicate and justify their ideas to enrich their learning.

# We believe that in Maths, all children should experience the following 5 big ideas:

- Follow the central component of the NCETM programme to develop the teaching of Mastery based around Five Big Ideas, drawn from research evidence, underpinning the teaching for mastery.
- 1. Coherence  
lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a broad range of contexts.
- 2. Representation and Structure  
Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation
- 3. Mathematical Thinking  
If taught ideas are to enrich learning and be understood deeply, they must not merely be passively received but must be worked on by the student, thought about, reasoned with and discussed with others
- 4. Fluency  
Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics
- 5. Variation  
Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect and challenge the mathematics, drawing attention to mathematical relationships and structure.



# Curriculum Drivers- How do our school values link to the subject?

- AMBITION (Success) – • The Maths curriculum at Peters Hill aims to promote high standards of Numeracy by equipping children with a broad range of vital skills which can be applied not only within school but used in everyday life. The desired outcome is to instill a deep and lasting interest in mathematics to last a lifetime.
- BELIEF (Confidence)– • It is important to encourage children to develop and nurture a range of strategies to help them solve problems, make links with other subjects and grow in confidence in the understanding of numbers. • Children are given praise, primarily for effort irrespective of getting the answer correct, they are listened to and their interpretations and methods acknowledged, and contributions valued.
- COMPASSION (Motivation) – • Peters Hill promotes a positive, enthusiastic and resilient attitude towards maths. Students are taught that everyone can become good at maths if they work hard and challenge themselves to constantly learn more. • Emphasis is given to developing mathematical thinking and going through the process of solving the problem rather than the goal being focused on simply getting the right answer.
- PRIDE (Knowledge)– • Because pupils will be well-practiced in using a wide range of written and mental methods, these skills will be committed to their long term memory and therefore pupils will have faith in their mathematical abilities • Pupils will have pride in having a sound understanding of calculation, number, shape, space and measures, and handling and interpreting data
- RESPECT (Responsibility) – • Children will be encouraged to take responsibility for setting personal goals so they feel accountable for their own learning. • Pupils will be encouraged to approach problems using different strategies and celebrate the fact that individuals can approach the problem in unique ways, reiterating how maths is dynamic and allows for different ways of thinking, cultivating an air of mutual respect.

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# Key Competencies

- The following documents set out the key competencies developed across the range of topics in each year group.
- These key competencies are set out as pathways to demonstrate how they link and progress throughout the school.
- These competencies are then planned into each topic through the half termly medium term planning process.
- These competencies combine to make the total schema that teaching staff use to assess the children at the end of the topic. This generates assessment judgements as set out on the following slide and happens three times a year.
- These total judgements average throughout the term. This total will fall between 1 to 5 depending on the outcome of each topic.

Novice	Simple idea	Relational idea	Multiple Links	Expert understanding
1	2	3	4	5
The task is not attacked appropriately; the pupil hasn't really understood the point and uses too simple a way of going about it.	The pupil's response only focuses on one relevant aspect.	The pupil's response focuses on several relevant aspects but they are treated independently and additively. Assessment of this level is primarily quantitative.	The different aspects have become integrated into a coherent whole. This level is what is normally meant by an adequate understanding of some topic.	The previous integrated whole may be conceptualised at a higher level of abstraction and generalised to a new topic or area.
Well below - Has significant difficulties in successfully accessing the competencies	Below - Can access key competencies of the schema but need significant support to do so.	Emerging - Started to unlock key competencies of the schema but not yet secure. Support can be required.	Secure - Securely unlocked the key competencies of the schema. No support is required.	Mastered - Can apply the competencies of the schema with fluency in different contexts.

# Key Competency Expectations

## Well Below

Working well below the standard. Has significant difficulties in accessing the key competencies.

## Below

Working below the standard. Can access key competencies of the schema but needs support to do so.

## Emerging

Emerging towards the standard. Started to unlock key competencies of the schema but not yet secure. Support can be required.

## Secure

Meeting the standard. Securely unlocked the key competencies of the schema. No support is required.

## Mastered

High attaining within the standard. Can apply the competencies of the schema with fluency in different contexts.

# The Pathways

Children become proficient mathematicians through the development of learning across key pathways. These are;

- Pathway 1 – Number: Place Value
- Pathway 2 – Number: Addition and Subtraction
- Pathway 3 – Multiplication and Division
- Pathway 4 – Number: Fractions
- Pathway 5 – Measurement: Length and Height, Weight and Volume, Money
- Pathway 6 – Time
- Pathway 7 – Geometry: Shape, Position and Direction
- Pathway 8 – Statistics
- Pathway 9 – Decimals and Percentages
- Pathway 10 – Ratio and Proportion
- Pathway 11 – Algebra

*\*Green highlights indicate ready-to-progress criteria*

Pathway 1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Number: Place Value</b>  <b>Counting</b>   <b>Represent</b>   <b>Use PV and Compare</b>   <b>Problems and Rounding</b>	<ul style="list-style-type: none"> <li>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. (See RTPC 1NPV-1)</li> <li>Count, read and write numbers to 100 in numerals</li> <li>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than, most, least</li> <li>Read and write numbers from 1 to 20 in numerals and words</li> <li>Given a number, identify one more and one less</li> <li>Reason about the location of numbers to 20 within the linear number system, including comparing using <math>&lt;</math>, <math>&gt;</math> and <math>=</math>. (See RTPC 1NPV-2)</li> </ul>	<ul style="list-style-type: none"> <li>Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward</li> <li>Read and write numbers to at least 100 in numerals and in words</li> <li>Identify, represent and estimate numbers using different representations including the number line</li> <li>Recognise the place value of each digit in a two digit number (tens, ones) and compose and decompose two-digit numbers using standard and nonstandard partitioning. (See RTPC 2NPV-1)</li> <li>Compare and order numbers from 0 up to 100; use <math>&lt;</math>, <math>&gt;</math> and <math>=</math> signs</li> <li>Use place value and number facts to solve problems</li> <li>Reason about the location of any two digit number in the linear number system, including identifying the previous and next multiple of 10. (See RTPC 2NPV-2)</li> </ul>	<ul style="list-style-type: none"> <li>Count from 0 in multiples of 4, 8, 50 and 100</li> <li>Find 10 or 100 more or less than a given number. Reason about the location of any three digit number in the linear number system, including identifying the previous and next multiple of 100 and 10. (See RTPC 3NPV-1)</li> <li>Identify, represent and estimate numbers using different Representations</li> <li>Read and write numbers up to 1000 in numerals and in words</li> <li>Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three digit multiples of 10. (See RTPC 3NPV-1)</li> <li>Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) and compose and decompose three-digit numbers using standard and non-standard partitioning. (See RTPC 3NPV-2)</li> <li>Compare and order numbers up to 1000</li> <li>Solve number problems and practical problems involving these ideas</li> <li>Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal</li> </ul>	<ul style="list-style-type: none"> <li>Count in multiples of 6, 7, 9, 25 and 1000</li> <li>Count backwards through zero to include negative numbers</li> <li>Identify, represent and estimate numbers using different representations</li> <li>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</li> <li>Find 1000 more or less than a given number. (See RTPC 4NPV-3)</li> <li>Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones) and compose and decompose four-digit numbers using standard and nonstandard partitioning. (See RTPC 4NPV-2)</li> <li>Order and compare numbers beyond 1000 Reason about the location of any four digit number in the linear number system. (See RTPC 4NPV-3)</li> <li>Round any number to the nearest 10, 100 or 1000. (See RTPC 4NPV-3)</li> <li>Solve number and practical problems that involve all of the above and with increasingly large positive numbers</li> </ul>	<ul style="list-style-type: none"> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1000000</li> <li>Read, write, order and compare numbers to at least 1000000 and determine the value of each digit</li> <li>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals</li> <li>Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. (See RTPC 5NPV-4)</li> <li>Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01 (See RTPC 5NPV-1)</li> <li>Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and nonstandard partitioning. (See RTPC 5NPV-2)</li> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero</li> </ul>	<ul style="list-style-type: none"> <li>Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit. Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning (See RTPC 6NPV-2)</li> <li>Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). (See RTPC 6NPV-1)</li> <li>Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts. See RTPC 6NPV-4</li> <li>Round any whole number to a required degree of accuracy. Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate.</li> </ul>



*\*Green highlights indicate ready-to-progress criteria*

<p><b>Number: Place Value</b></p> <p><b>Problems and Rounding</b></p>				<ul style="list-style-type: none"> <li>Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100. (See RTPC 4NPV-1)</li> <li>Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts. (See RTPC 4NPV-4)</li> </ul>	<ul style="list-style-type: none"> <li>Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000</li> <li>Solve number problems and practical problems that involve all of the above</li> </ul>	<p>including in contexts. (See RTPC 6NPV-3)</p> <ul style="list-style-type: none"> <li>Use negative numbers in context, and calculate intervals across zero</li> <li>Solve number and practical problems that involve all of the above</li> </ul>
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\*Green highlights indicate ready-to-progress criteria

Pathway 2	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Number:</b> Addition and Subtraction</p> <p>Recall, Represent, Use</p>	<ul style="list-style-type: none"> <li>Represent and use number bonds and related subtraction facts within 20. Develop fluency in addition and subtraction facts within 10. (See RTPC 1NF-1)</li> <li>Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. (See RTPC 1AS-1)</li> <li>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs, and relate additive expressions and equations to real-life contexts. (See RTPC 1AS-2)</li> </ul>	<ul style="list-style-type: none"> <li>Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. Secure fluency in addition and subtraction facts within 10, through continued practice. (See RTPC 2NF-1)</li> <li>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</li> <li>Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</li> </ul>	<ul style="list-style-type: none"> <li>Estimate the answer to a calculation and use inverse operations to check answers</li> </ul>	<ul style="list-style-type: none"> <li>Estimate and use inverse operations to check answers to a calculation</li> </ul>	<ul style="list-style-type: none"> <li>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</li> </ul>	
<p><b>Calculations</b></p>	<ul style="list-style-type: none"> <li>Add and subtract one-digit and two-digit numbers to 20, including zero</li> </ul>	<ul style="list-style-type: none"> <li>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. Add and subtract across 10 (See RTPC 2AS-1)</li> <li>Add and subtract within 100 by</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds. Secure fluency in addition and subtraction facts that bridge 10, through continued practice. (See RTPC 3NF-1)</li> <li>Calculate complements to 100. (See RTPC 3AS-1)</li> <li>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. (See RTPC 3AS-2)</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</li> <li>Add and subtract numbers mentally with increasingly large numbers</li> </ul>	<ul style="list-style-type: none"> <li>Perform mental calculations, including with mixed operations and large numbers</li> <li>Use their knowledge of the order of operations to carry out calculations involving the four operations</li> </ul>

\*Green highlights indicate ready-to-progress criteria

Number:  
Addition and  
Subtraction

Calculations

Solve  
Problems

		<p>applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two digit number. Add and subtract any 2 two digit numbers. (See RTPC 2AS-3 and 2AS-4)</p> <ul style="list-style-type: none"> <li>Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?" (See RTPC 2AS-3)</li> </ul>				
<ul style="list-style-type: none"> <li>Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math></li> </ul>	<ul style="list-style-type: none"> <li>Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</li> <li>Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). (See RTPC 3NF-3)</li> <li>Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction. (See RTPC 3AS-3)</li> </ul>	<ul style="list-style-type: none"> <li>Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why</li> </ul>	<ul style="list-style-type: none"> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving addition, subtraction, multiplication and division</li> <li>Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy</li> <li>Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number) See RTPC 6AS/MD-1</li> <li>Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. (See RTPC 6AS/MD-2)</li> <li>Solve addition and subtraction multi steps problems in contexts, deciding which operations and methods to use and why</li> </ul>	



\*Green highlights indicate ready-to-progress criteria

Pathway 3	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Number: Multiplication and division</b></p> <p><b>Recall, Represent, Use</b></p> <p><b>Calculations</b></p>	<ul style="list-style-type: none"> <li>Count in multiples of twos, fives and tens. Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. (See RTPC 1NF-2)</li> </ul>	<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for the 2, 5, and 10 times tables, including recognising odd and even numbers. Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. (See RTPC 2MD-1)</li> <li>Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</li> <li>Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</li> </ul>	<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number. (See RTPC 3NF-2)</li> <li>Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two digit numbers times one-digit numbers, using mental and progressing to formal written methods</li> </ul>	<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for multiplication tables up to <math>12 \times 12</math> and recognise products in multiplication tables as multiples of the corresponding number. (See RTPC 4NF-1)</li> <li>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</li> <li>Recognise and use factor pairs and commutativity in mental calculations. Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication. (See RTPC 4MD-2)</li> <li>Multiply two digit and three digit numbers by a one digit number using formal written layout</li> <li>Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100) (See RTPC 4NF-3)</li> <li>Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. (See RTPC 4MD-1)</li> </ul>	<ul style="list-style-type: none"> <li>Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors (See RTPC SMD-2)</li> <li>Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</li> <li>Establish whether a number up to 100 is prime and recall prime numbers up to 19</li> <li>Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</li> <li>Multiply and divide numbers mentally drawing upon known facts. Secure fluency in multiplication table facts, and corresponding division facts, through continued practice. (See RTPC 5NF-1)</li> <li>Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for 2 digit numbers (See RTPC SMD-3)</li> <li>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 See RTPC SMD-4</li> </ul>	<ul style="list-style-type: none"> <li>Identify common factors, common multiples and prime numbers</li> <li>Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy</li> <li>Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication</li> <li>Divide numbers up to 4 digits by a 2-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</li> <li>Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context</li> </ul>

\*Green highlights indicate ready-to-progress criteria

<p><b>Number:</b> Multiplication and division</p>					<ul style="list-style-type: none"> <li>• Multiply and divide numbers by 10, 100 and 1000; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size (See RTPC SMD-1)</li> </ul>	<ul style="list-style-type: none"> <li>• Perform mental calculations, including with mixed operations and large numbers</li> <li>• Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. (See RTPC 6AS/MD-2)</li> </ul>
<p><b>Solve Problems</b></p>	<ul style="list-style-type: none"> <li>• 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</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts</li> <li>• Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division) (See RTPC 2MD-2)</li> </ul>	<ul style="list-style-type: none"> <li>• 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 objectives</li> <li>• Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division. (See RTPC 3MD-1)</li> <li>• Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). (See RTPC 3NF-3)</li> </ul>	<ul style="list-style-type: none"> <li>• 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. Understand and apply the distributive property of multiplication. (See RTPC 4MD-3)</li> <li>• Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context. (See RTPC 4NF-2)</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes, scaling by simple fractions and problem solving involving simple rates</li> <li>• Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth). (See RTPC 5NF-2)</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems involving addition, subtraction, multiplication and division</li> <li>• Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number. (See RTPC 6AS/MD-1)</li> </ul>
<p><b>Combined Operations</b></p>					<ul style="list-style-type: none"> <li>• Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign</li> </ul>	<ul style="list-style-type: none"> <li>• Use their knowledge of the order of operations to carry out calculations involving the four operations</li> </ul>

\*Green highlights indicate ready-to-progress criteria

Pathway 4	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Number: Fractions</b>  <b>Recognise and Write</b>	<ul style="list-style-type: none"> <li>Recognise, find and name a half as one of two equal parts of an object, shape or quantity</li> <li>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</li> </ul>	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers of quantities by 10</li> <li>Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</li> <li>Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</li> <li>Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts. (See RTPC 3F-4)</li> </ul>	<ul style="list-style-type: none"> <li>Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten</li> </ul>	<ul style="list-style-type: none"> <li>Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths and understand that they have the same value and the same position in the linear number system. (See RTPC 5F-2)</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt;1</math> as a mixed number [for example <math>2\frac{2}{5} + 4\frac{4}{5} = 6\frac{6}{5} = 1\frac{1}{5}</math>]</li> <li>Read and write decimal numbers as fractions [for example <math>0.71 = \frac{71}{100}</math>]</li> </ul>	
<b>Compare</b>		<ul style="list-style-type: none"> <li>Recognise the equivalence of <math>\frac{2}{4}</math> and <math>\frac{1}{2}</math></li> </ul>	<ul style="list-style-type: none"> <li>Recognise and show, using diagrams, equivalent fractions with small denominators</li> <li>Compare and order unit fractions, and fractions with the same denominators</li> </ul>	<ul style="list-style-type: none"> <li>Recognise and show, using diagrams, families of common equivalent fractions</li> </ul>	<ul style="list-style-type: none"> <li>Compare and order fractions whose denominators are multiples of the same number</li> </ul>	<ul style="list-style-type: none"> <li>Use common factors to simplify fractions; use common multiples to express fractions in the same denominator. (See RTPC 6F-1)</li> <li>Compare and order fractions, including fractions <math>&gt;1</math>. Express fractions in a common denominator and use this to compare fractions that are similar in value. (See RTPC 6F-2) Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denominator as a comparison strategy (See RTPC 6F-3)</li> <li>Generate and describe linear number sequences (with fractions)</li> </ul>
<b>Calculations</b>		<ul style="list-style-type: none"> <li>Write simple fractions for example, <math>\frac{1}{2}</math> of <math>6 = 3</math></li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract fractions with the same denominator within one whole (for example, <math>\frac{5}{7} + \frac{1}{7} = \frac{6}{7}</math>) (See RTPC 3F-4)</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract fractions with the same denominator, including improper and mixed fractions and bridging whole numbers. (See RTPC 4F-3)</li> <li>Convert mixed numbers to improper fractions and</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number</li> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</li> <li>Find non-unit fractions of quantities. (See RTPC 5F-4)</li> </ul>	<ul style="list-style-type: none"> <li>Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions</li> <li>Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example <math>\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}</math>]</li> <li>Divide proper fractions by whole numbers [for example <math>\frac{1}{3} \div 2 = \frac{1}{6}</math>]</li> </ul>



\*Green highlights indicate ready-to-progress criteria

<p>Number: Fractions</p> <p>Solve Problems</p>			<ul style="list-style-type: none"> <li>Solve problems that involve all of the above</li> <li>Find unit fractions of quantities using known division facts (multiplication tables fluency). (See RTPC 3F-2)</li> <li>Reason about the location of any fraction within 1 in the linear number system. (See RTPC 3F-3)</li> </ul>	<p>vice versa). (See RTPC 4F-2)</p> <ul style="list-style-type: none"> <li>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</li> <li>Reason about the location of mixed numbers in the linear number system. (See RTPC 4F-1)</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</li> </ul>	<ul style="list-style-type: none"> <li>Associate a fraction with division and calculate decimal fraction equivalents [ for example, 0.375] for a simple fraction [for example 3/8]</li> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</li> </ul>
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\*Green highlights indicate ready-to-progress criteria

Pathway 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Measurement:</b>  <b>Length and height</b>  <b>Weight and volume</b>  <b>Perimeter, Area, Volume</b>  <b>Money</b>	<ul style="list-style-type: none"> <li>Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)</li> <li>Compare, describe and solve practical problems for: mass/weight (for example, heavy/light, heavier than, lighter than); capacity and volume (for example full/ empty, more than, less than, half, half full, quarter)</li> <li>Measure and begin to record the following: Lengths and heights, mass and weight, capacity and volume</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>Compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =</li> </ul>	<ul style="list-style-type: none"> <li>Measure, compare, add and subtract: lengths (m/cm/mm) ; mass (kg/g) volume/capacity (l/ml)</li> <li>Measure the perimeter of simple 2D shapes</li> <li>Add and subtract amounts of money to give change, using both £ and p in practical contexts</li> </ul>	<ul style="list-style-type: none"> <li>Convert between different units of measure (for example, kilometre to metre)</li> <li>Find the area of rectilinear shapes by counting squares</li> <li>Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</li> <li>Estimate, compare and calculate different measures, including money in pounds and pence</li> <li>Solve simple measure and money problems involving fractions and decimals to two decimal places</li> </ul>	<ul style="list-style-type: none"> <li>Convert between different units of metric measure (for example, km and m; cm and m; cm and mm; g and kg; l and ml) Convert between units of measure, including using common decimals and fractions. See RTPC SNPV-3</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</li> <li>Estimate volume (for example using 1cm<sup>3</sup> blocks to build cuboids (including cubes)) and capacity (for example, using water)</li> <li>Measure and calculate the perimeter of composite rectilinear shapes in cm and m</li> <li>Calculate and compare the area of rectangles (including squares) and including using standard units, cm<sup>2</sup>, m<sup>2</sup> estimate the area of irregular shapes. (See RTPC SG-2)</li> <li>Use all four operations to solve problems involving measure) e.g. length, mass, volume, money) using decimal notation, including scaling</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate</li> <li>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 3dp</li> <li>Convert between miles and kilometres</li> <li>Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm<sup>3</sup>, m<sup>3</sup> and extending to other units (mm<sup>3</sup>, km<sup>3</sup>)</li> <li>Recognise that shapes with the same areas can have different perimeters and vice versa</li> <li>Recognise when it is possible to use formulae for area and volume of shapes</li> <li>Calculate the area of parallelograms and triangles</li> </ul>

*\*Green highlights indicate ready-to-progress criteria*

Pathway 6	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Time</b>	<ul style="list-style-type: none"> <li>Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</li> <li>Recognise and use language relating to dates, including days of the week, weeks, months and years</li> <li>Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times</li> <li>Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later]</li> <li>Measure and begin to record time (hours, minutes, seconds)</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>Know the number of minutes in an hour and the number of hours in a day</li> <li>Compare and sequence intervals of time</li> </ul>	<ul style="list-style-type: none"> <li>Tell and write the time from an analogue clock, including using Roman numerals from I to XII and 12-hour and 24-hour clocks</li> <li>Estimate and read time with increasing accuracy to the nearest minute</li> <li>Record and compare time in terms of seconds, minutes and hours</li> <li>Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight</li> <li>Know the number of seconds in a minute and the number of days in each month, year and leap year</li> <li>Compare durations of events [for example to calculate the time taken by particular events or tasks]</li> </ul>	<ul style="list-style-type: none"> <li><u>Convert between different units of measure</u> [for example, kilometre to metre; hour to minute]</li> <li>Read, write and convert time between analogue and digital 12 and 24 hour clocks.</li> <li>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving converting between units of time</li> </ul>	<p>Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa</p>



\*Green highlights indicate ready-to-progress criteria

Pathway 7	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Geometry:</b></p> <p><b>2-D and 3-D Shapes</b></p>	<ul style="list-style-type: none"> <li>Recognise and name common 2-D shapes, including: (for example, rectangles (including squares), circles and triangles)</li> <li>Recognise and name common 3-D shapes, including: (for example, cuboids (including cubes), pyramids and spheres.)</li> <li>Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another. (See RTPC 1G-1)</li> <li>Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations... (See RTPC 1G-2)</li> </ul>	<ul style="list-style-type: none"> <li>Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</li> <li>Identify 2-D shapes on the surface of 3-D shapes, (for example, a circle on a cylinder and a triangle on a pyramid)</li> <li>Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</li> <li>Compare and sort common 2-D and 3-D shapes and everyday objects. Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties. (See RTPC 2G-1)</li> </ul>	<ul style="list-style-type: none"> <li>Draw 2-D shapes and make 3-D shapes using modelling materials. Draw polygons by joining marked points, and identify parallel and perpendicular sides. (See RTPC 3G-2)</li> <li>Recognise 3-D shapes in different orientations and describe them</li> </ul>	<ul style="list-style-type: none"> <li>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify regular polygons, including equilateral triangles and squares, as those in which the side lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons. (See RTPC 4G-2)</li> </ul>	<ul style="list-style-type: none"> <li>Identify 3D shapes, including cubes and other cuboids, from 2D representations</li> <li>Use the properties of rectangles to deduce related facts and find missing lengths and angles</li> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles</li> </ul>	<ul style="list-style-type: none"> <li>Draw 2-D shapes using given dimensions and angles. Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. (See RTPC 6G-1)</li> <li>Compare and classify geometric shapes based on their properties and sizes</li> <li>Recognise, describe and build simple 3D shapes, including making nets</li> <li>Illustrate and name parts of a circle, including radius, diameter and circumference and know that the diameter is twice the radius</li> </ul>
<p><b>Angles and Lines</b></p>			<ul style="list-style-type: none"> <li>Recognise angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. (See RTPC 3G-1)</li> <li>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</li> <li>Identify horizontal and vertical lines and pairs of perpendicular and parallel lines</li> </ul>	<ul style="list-style-type: none"> <li>Identify acute and obtuse angles and compare and order angles up to two right angles by size</li> <li>Identify lines of symmetry in 2-D shapes presented in different orientations (See RTPC 4G-3)</li> <li>Complete a simple symmetric figure with respect to a specific line of symmetry (See RTPC 4G-3)</li> </ul>	<ul style="list-style-type: none"> <li>Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles (See RTPC 5G-1)</li> <li>Draw given angles, and measure them in degrees (0) (See RTPC 5G-1)</li> <li>Identify: angles at a point and one whole turn (total 360°), angles at a point on a straight line and <math>\frac{1}{2}</math> a turn (total 180°) other multiples of 90°</li> </ul>	<ul style="list-style-type: none"> <li>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</li> <li>Find unknown angles in any triangles, quadrilaterals and regular polygons</li> </ul>
<p><b>Position and direction</b></p>	<ul style="list-style-type: none"> <li>Describe position, direction and movement, including whole, half, quarter and three quarter turns</li> </ul>	<ul style="list-style-type: none"> <li>Use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)</li> <li>Order and arrange combinations of mathematical objects in patterns and sequences</li> </ul>		<ul style="list-style-type: none"> <li>Describe positions on a 2-D grid as coordinates in the first quadrant</li> <li>Plot specified points and draw sides to complete a given polygon. Draw polygons, specified by coordinates in the first quadrant and translate within the first quadrant. (See RTPC 4G-1)</li> <li>Describe movements between positions as translations of a given unit to the left/ right and up/ down</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Describe positions on the full coordinate grid (all four quadrants).</li> <li>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes</li> </ul>

*\*Green highlights indicate ready-to-progress criteria*

Pathway 8	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Statistics</b>  <b>Present and Interpret</b>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Interpret and construct simple pictograms, tally charts, block diagrams and simple tables</li> </ul>	<ul style="list-style-type: none"> <li>Interpret and present data using bar charts, pictograms and tables</li> </ul>	<ul style="list-style-type: none"> <li>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</li> </ul>	<ul style="list-style-type: none"> <li>Complete, read and interpret information in tables including timetables</li> </ul>	<ul style="list-style-type: none"> <li>Interpret and construct pie charts and line graphs and use these to solve problems</li> </ul>
<b>Solve Problems</b>		<ul style="list-style-type: none"> <li>Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</li> <li>Ask and answer questions about totalling and comparing categorical data</li> </ul>	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs</li> </ul>	<ul style="list-style-type: none"> <li>Solve comparison, sum and difference problems using information presented in a line graph</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the mean as an average</li> </ul>

\*Green highlights indicate ready-to-progress criteria

Pathway 9	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Decimals				<ul style="list-style-type: none"> <li>Recognise and write decimal equivalents of any number of tenths or hundredths as well as <math>\frac{1}{4}</math>, <math>\frac{1}{2}</math> and <math>\frac{3}{4}</math></li> </ul>	<ul style="list-style-type: none"> <li>Read and write decimal numbers as fractions (e.g. <math>0.71 = \frac{71}{100}</math>)</li> <li>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</li> </ul>	<ul style="list-style-type: none"> <li>Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places</li> </ul>
Recognise and Write						
Compare				<ul style="list-style-type: none"> <li>Compare numbers with the same number of decimal places up to two decimal places</li> <li>Round decimals with one decimal place to the nearest whole number</li> </ul>	<ul style="list-style-type: none"> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place</li> <li>Read, write, order and compare numbers with up to three decimal places. Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. (See RTPC SNPV-3)</li> <li>Recall decimal fraction equivalents for <math>\frac{1}{4}</math>, <math>\frac{1}{2}</math>, <math>\frac{1}{5}</math>, <math>\frac{1}{10}</math>, and , and for multiples of these proper fractions (See RTPC SF-3)</li> </ul>	
Calculations and Problems				<ul style="list-style-type: none"> <li>Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving number up to three decimal places</li> <li>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</li> <li>Use all four operations to solve problems involving measure [ for example, length, mass, volume, money] using decimal notation, including scaling</li> </ul>	<ul style="list-style-type: none"> <li>Associate a fraction with division and calculate decimal fraction equivalents (e.g. <math>0.375</math>) for a simple fraction (e.g. <math>\frac{3}{8}</math>)</li> <li>Multiply one-digit numbers with up to 2 decimal places by whole numbers</li> <li>Use written division methods in cases where the answer has up to 2 decimal places</li> <li>Solve problems which require answers to be rounded to specified degrees of accuracy</li> </ul>





*\*Green highlights indicate ready-to-progress criteria*

Percentages					<ul style="list-style-type: none"><li>• 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</li><li>• Solve problems which require knowing percentage and decimal equivalents of %, <math>\frac{1}{2}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math> and those fractions with a denominator of a multiple of 10 or 25.</li></ul>	<ul style="list-style-type: none"><li>• Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison</li><li>• Recall and use equivalences between simple fractions, decimals and percentages including in different contexts</li></ul>
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\*Green highlights indicate ready-to-progress criteria

Pathway 10		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio and Proportion		•	•	•	•	•	<ul style="list-style-type: none"> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts <b>Solve problems involving ratio relationships. (See RTPC 6AS/MD-3)</b></li> <li>Solve problems involving similar shapes where the scale factor is known or can be found</li> <li>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples</li> </ul>

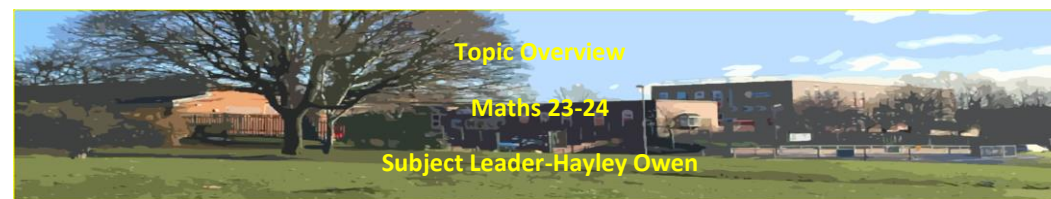
*\*Green highlights indicate ready-to-progress criteria*

Pathway 11	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Algebra</b>  <i>*NOTE: Although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the missing number objectives from Y1/2/3</i>	<ul style="list-style-type: none"> <li>Solve one-step problems that involve addition and subtraction using concrete objects and pictorial representations, and missing numbers problems such as <math>7 = ? - 9</math></li> </ul>	<ul style="list-style-type: none"> <li>Recognise and use the inverse relationship between addition and subtraction and use to check calculations and solve missing number problems</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems including missing number problems</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Use simple formulae</li> <li>Generate and describe linear number sequences</li> <li>Express missing number problems algebraically</li> <li>Find pairs of numbers that satisfy an equation with two unknowns. <b>Solve problems with 2 unknowns. (See RTPC 6AS/MD-4)</b></li> <li>Enumerate possibilities of combinations of two variables</li> </ul>



# IMPLEMENTATION

# Topic Overview



Green Highlight = Ready to Progress Strands

**Year 1 Autumn**  
**Number:** Place Value (within 10)  
**Number:** Addition and Subtraction (within 10)  
**Number:** Facts  
**Geometry:** Shape

**Year 2 Autumn**  
**Number:** Place Value  
**Number:** Addition and Subtraction  
**Number:** Facts  
**Geometry:** Properties of Shape

**Year 3 Autumn**  
**Number:** Place Value  
**Number:** Addition and Subtraction  
**Number:** Multiplication and Division

**Year 4 Autumn**  
**Number:** Place Value  
**Number:** Addition and Subtraction  
**Measurement:** Area  
**Number:** Multiplication and Division

**Year 5 Autumn**  
**Number:** Place Value  
**Number:** Addition and Subtraction  
**Number:** Facts  
**Number:** Multiplication and Division  
**Number:** Fractions

**Year 6 Autumn**  
**Number:** Place Value  
**Number:** Addition, Subtraction, Multiplication and Division  
**Number:** Facts  
**Number:** Fractions  
**Measurement:** Converting Units

**Year 1 Spring**  
**Number:** Place Value (within 20)  
**Number:** Addition and Subtraction (within 20)  
**Number:** Place Value (within 50)  
**Measurement:** Length and Height  
**Measurement:** Mass and Volume

**Year 2 Spring**  
**Measurement:** Money  
**Number:** Multiplication and Division  
**Measurement:** Length and Height  
**Measurement:** Mass, Capacity and Temperature

**Year 3 Spring**  
**Number:** Multiplication and Division  
**Measurement:** Length and Perimeter  
**Number:** Fractions  
**Measurement:** Mass and Capacity

**Year 4 Spring**  
**Number:** Multiplication and Division  
**Measurement:** Length and Perimeter  
**Number:** Fractions  
**Number:** Decimals

**Year 5 Spring**  
**Number:** Multiplication and Division  
**Number:** Fractions  
**Number:** Decimals and Percentages  
**Measurement:** Perimeter and Area  
**Statistics**

**Year 6 Spring**  
**Number:** Ratio  
**Number:** Algebra  
**Number:** Decimals  
**Number:** Fractions, Decimals, Percentages  
**Measurement:** Perimeter, Area and Volume  
**Statistics**

**Year 1 Summer**  
**Number:** Multiplication and Division  
**Number:** Fractions  
**Geometry:** Position and Direction  
**Number:** Place Value (within 100)  
**Measurement:** Money  
**Measurement:** Time

**Year 2 Summer**  
**Number:** Fractions  
**Measurement:** Time  
**Statistics**  
**Geometry:** Position and Direction  
**Consolidation**

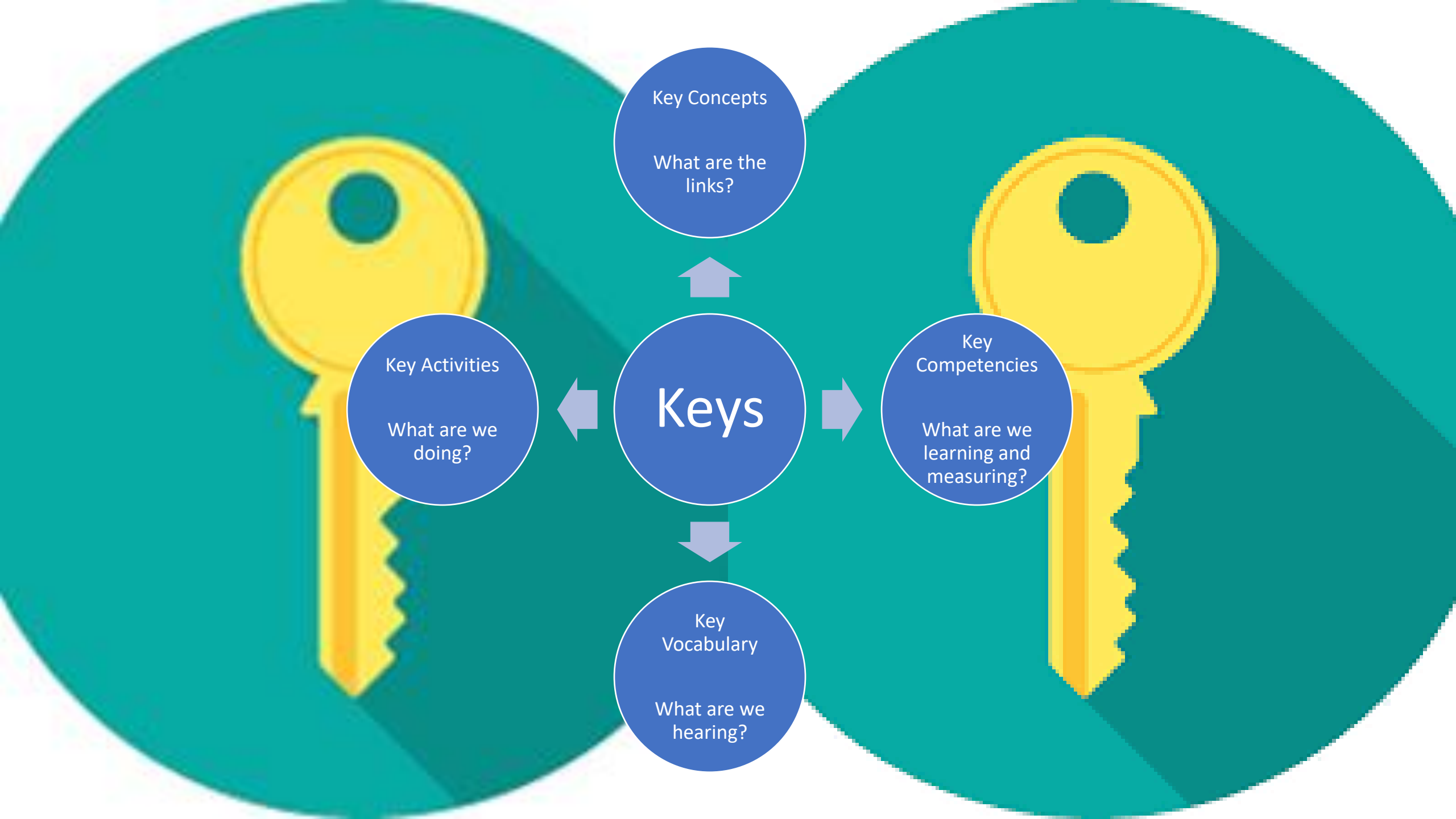
**Year 3 Summer**  
**Number:** Fractions  
**Measurement:** Money  
**Measurement:** Time  
**Geometry:** Properties of Shape  
**Statistics**

**Year 4 Summer**  
**Number:** Decimals  
**Measurement:** Money  
**Measurement:** Time  
**Geometry:** Properties of Shape  
**Statistics**  
**Geometry:** Position and Direction

**Year 5 Summer**  
**Geometry:** Properties of Shape  
**Geometry:** Position and Direction  
**Number:** Decimals  
**Number:** Negative numbers  
**Measurement:** Converting Units  
**Measurement:** Volume  
**Year 6 Summer**

**Geometry:** Properties of Shape  
**Geometry:** Position and Direction  
**Problem Solving**  
**Investigations**





# Maths in the EYFS

- The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. The aim of this document is to help subject leaders to understand how the skills taught across EYFS feed into national curriculum subjects.
- This document demonstrates which statements from the 2020 Development Matters are prerequisite skills for mathematics within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for mathematics.
- The most relevant statements for mathematics are taken from the following areas of learning:
  - Communication and Language
  - Mathematics

## Mathematical Vocabulary

**Three and  
Four-Year-  
Olds**

Communication and Language

**Use a wider range of vocabulary.  
Understand 'why' questions, like: "why do you  
think the caterpillar is so fat?"**

**Reception**

Communication and Language

**Learn new vocabulary.  
Use new vocabulary throughout the day.**

**ELG**

Communication  
and Language

Speaking

**Participate in small group, class and one-to-one  
discussions, offering their own ideas, using  
recently introduced vocabulary.**



Number and Place Value			
Counting			
Three and Four-Year-Olds	Mathematics		<p>Recite numbers past 5.</p> <p>Say one number name for each item in order: 1, 2, 3, 4, 5.</p> <p>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</p>
Reception	Mathematics		<p>Count objects, actions and sounds.</p> <p>Count beyond ten.</p>
ELG	Mathematics	Numerical Patterns	Verbally count beyond 20, recognising the pattern of the counting system.
Identifying, Representing and Estimating Numbers			
Three and Four-Year-Olds	Mathematics		<p>Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').</p> <p>Show 'finger numbers' up to 5.</p> <p>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</p> <p>Experiment with their own symbols and marks as well as numerals.</p>
Reception	Mathematics		<p>Subitise.</p> <p>Link the number symbol (numeral) with its cardinal number value.</p>
ELG	Mathematics	Number	Subitise (recognising quantities without counting) up to 5.

## Reading and Writing Numbers

Three and Four-Year-Olds	Mathematics	Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.  Experiment with their own symbols and marks as well as numerals.
Reception	Mathematics	Link the number symbol (numeral) with its cardinal number value.

## Compare and Order Numbers

Three and Four-Year-Olds	Mathematics		Compare quantities using language: 'more than', 'fewer than'.
Reception	Mathematics		Compare numbers.
ELG	Mathematics	Numerical Patterns	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.

## Understanding Place Value

Reception	Mathematics		Understand the 'one more than/one less than' relationship between consecutive numbers.
			Explore the composition of numbers to 10.
ELG	Mathematics	Number	Have a deep understanding of numbers to 10, including the composition of each number.

## Solve Problems

Three and Four-Year-Olds	Mathematics	Solve real world mathematical problems with numbers up to 5.
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## Addition and Subtraction

### Mental Calculations

Reception	Mathematics		Automatically recall number bonds for numbers 0-5 and some to 10.
ELG	Mathematics	Number	Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

### Solve Problems

ELG	Mathematics	Numerical Patterns	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.
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## Measurement

### Describe, Measure, Compare and Solve (All Strands)

Three and Four-Year-Olds	Mathematics	Make comparisons between objects relating to size, length, weight and capacity.
Reception	Mathematics	Compare length, weight and capacity.

## Telling the Time

Three and Four-Year-Olds	Mathematics	Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then...'
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## Statistics

### Record, Present and Interpret Data

Three and Four-Year-Olds	Mathematics	Experiment with their own symbols and marks, as well as numerals.
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## Properties of Shapes

### Recognise 2D and 3D Shapes and their Properties

Three and Four-Year-Olds	Mathematics	<p>Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'flat', 'round'.</p> <p>Select shapes appropriately: flat surfaces for a building, a triangular pattern for a roof, etc.</p> <p>Combine shapes to make new ones – an arch, a bigger triangle, etc.</p>
Reception	Mathematics	<p>Select, rotate and manipulate shapes in order to develop spatial reasoning skills.</p>

### Compare and Classify Shapes

Reception	Mathematics	<p>Compose and decompose shapes so that children can recognise a shape can have other shapes within it, just as numbers can.</p>
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## Position and Direction

### Position, Direction and Movement

Three and Four-Year-Olds	Mathematics	Understand position through words alone – for example, “The bag is under the table,” – with no pointing. Describe a familiar route. Discuss routes and locations, using words like ‘in front of’ and ‘behind’.
Reception	Understanding the World	Draw information from a simple map.

### Patterns

Three and Four-Year-Olds	Mathematics	Talk about and identify the patterns around them. For example, stripes on clothes, designs on rugs and wallpaper. Use informal language like ‘pointy’, ‘spotty’, ‘blobs’, etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern.
Reception	Mathematics	Continue, copy and create repeating patterns.

# Reception

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## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Getting to know you		Match, sort and compare		Talk about measure and patterns		It's me 1, 2, 3		Circles and triangles	1, 2, 3, 4, 5		Shapes with 4 sides
Spring	Alive in 5		Mass and capacity	Growing 6, 7, 8		Length, height and time		Building 9 and 10		Explore 3-D shapes		
Summer	To 20 and beyond		How many now?	Manipulate, compose and decompose		Sharing and grouping		Visualise, build and map		Make connections	Consolidation	



## Key Language for Teachers



**Cardinal** - The number that indicates how many there are in a set.

**Classification** - The identification of an object by specific attributes, such as colour, texture, shape or size.

**Conservation** (of number) - The recognition that the number stays the same if none have been added or taken away.

**Numeral** - The written symbol for a number; e.g. 3, 2, 1

**Ordinal** - A number denoting the position in a sequence e.g. 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, etc or page 1, page 2, page 3...

**Partition** - Separate a set into two or more subsets e.g. Partition a set of socks into plain and patterned.

**Subitise** - Instantly recognise a small quantity, without having to count how many there are.

**Number** - Number can be:

- a count of a collection of items e.g. three boxes,
- a measure e.g. of length or weight, or
- a label e.g. the number 17 bus

**Quantity** - The amount you have of something e.g. a cup of flour, three boxes, half an hour.

## The Counting Principles

Following research from Gelman and Gallistel in 1978, it is vital that teachers understand the five counting principles. (Gelman, R. & Gallistel, C. (1978) The Child's Understanding of Number. Cambridge, MA. Harvard University Press.)

I

**The one-one principle.** This involves children assigning one number name to each object that is being counted. Children need to ensure that they count each object only once ensuring they have counted every object.

Children will sometimes count objects more than once or miss an object out that needs to be counted. Encourage children to line up objects and touch each one as they count saying one number name per object. This will also help to avoid children counting more quickly than they touch the objects which again shows they have not grasped one-one correspondence.



1



2



3



4



5



## The Counting Principles

2

**The stable-order principle.** Children understand when counting, the numbers have to be said in a certain order.

Children need to know all the number names for the amount in the group they are counting. Teachers can therefore encourage children to count aloud to larger numbers without expecting them to count that number of objects immediately.

3

**The cardinal principle.** Children understand that the number name assigned to the final object in a group is the total number of objects in that group.

In order to grasp this principle, children need to understand the one-one and stable-order principle. From a larger group, children select a given number and count them out. When asked 'how many?', children should be able to recall the final number they said. Children who have not grasped this principle will recount the whole group again.

## The Counting Principles



4

**The abstraction principle.** This involves children understanding that anything can be counted including things that cannot be touched including sounds and movements e.g. jumps.

When starting to count, many children rely on touching the objects in order to count accurately. Teachers can encourage abstraction on a daily basis by counting claps or clicks. They can also count imaginary objects in their head to encourage counting on, this involves the children visualising objects.

5

**The order-irrelevance principle.** This involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number.

Encourage children to count objects, left to right, right to left, top to bottom and bottom to top. Once children have counted a group, move the objects and ask children how many there are, if they count them all again they have not fully grasped this principle.

**New**

**Reception schemes  
of learning**

**Non-statutory curriculum mapping**  
September 2023



# Introduction

The aim of this document is to give an at a glance guide to how the White Rose Maths Reception schemes of learning link to the two forms of non-statutory curriculum guidance for the EYFS, Development Matters (DFE 2021) and Birth to 5 Matters (Early Education 2021)

These statements are taken from documents that explicitly say they are suggestions of what "children will be learning to do" and "what children might be doing". They are not to be used or intended to be focused on as a tick list.

Reception | Autumn term | Block 3 – It's me 1, 2, 3 | Step 6

Composition of 1, 2 and 3

**Notes and guidance**

In this small step, children are introduced to the idea that all numbers are made up of smaller numbers, and these are referred to as the parts of the number. Learning to see a whole number and its parts at the same time is a key development in children's number understanding.

Give children practical opportunities to explore a range of ways to partition a whole number, so they can find different parts which make the same whole. Then show children how to explore the different ways their numbers can be partitioned into more than two parts. For example, 3 can be composed of 1 and 1 and 1.

Although the focus of this step is on numbers to 3, children may choose to notice and explore the composition of greater numbers in their play.

**Key questions**

- How many different ways can you make 1 (2) 3?
- How can you show 2 (3) in a different way?
- How many did you count? How do you know?
- What number have I made?
- Can you make the same number in a different way?

**Possible sentence stems**

- I can see \_\_\_\_\_ is made up of \_\_\_\_\_ and \_\_\_\_\_.
- I can see \_\_\_\_\_ is made up of \_\_\_\_\_ and \_\_\_\_\_.
- There is \_\_\_\_\_ here and \_\_\_\_\_ there so there must be \_\_\_\_\_ altogether.

**Links to the curriculum**

- Development Matters – Reception – Explore the composition of numbers to 10
- Birth to 5 Matters – Range 5 – Separates a group of three or four objects in different ways, beginning to recognise that the total is the same.

**Rhymes**

- Three Little Ducks

**Books**

- The Three Billy Goats Gruff

On each of our small steps we reference where in both documents there are links to the curriculum so teachers can see this direct link as you teach each small step.

## Cardinality

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Fast recognition of up to 3 objects, without having to count them individually (subitising).</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total (cardinal principle).</li> <li>Show 'finger numbers' up to 5.</li> </ul>	<ul style="list-style-type: none"> <li>Subitise</li> <li>Link the number symbol (numeral) with its cardinal number value.</li> </ul>	<ul style="list-style-type: none"> <li>Subitises one, two and three objects without counting.</li> <li>Counts up to five items, recognising that the last number said represents the total counted so far (cardinal principle).</li> <li>Links numerals with amounts up to 5 and maybe beyond.</li> <li>Explores using a range of their own marks and signs to which they ascribe mathematical meanings.</li> </ul>	<ul style="list-style-type: none"> <li>Engages in subitising numbers to four and maybe five.</li> <li>Counts out up to 10 objects from a larger group.</li> <li>Matches the numeral with a group of items to show how many there are (up to 10).</li> </ul>

Many schools require teachers to show coverage. This document is designed to support teachers in Reception to easily show this.

Each of the major topic areas have been broken down into key mathematical concepts so you can then see which statements from both documents are covered together with the term and block of the White Rose Maths Reception scheme.

This document gives teachers confidence of the wide coverage given in the White Rose Maths Reception schemes.



The background of the slide is a vibrant yellow, featuring a series of concentric, overlapping circles in varying shades of yellow and light green, creating a dynamic, organic pattern. A white rectangular box is centered horizontally and vertically on the slide, containing the word "Number" in a bold, dark blue font.

**Number**

# Comparison

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> </ul>	<ul style="list-style-type: none"> <li>Count objects, actions and sounds.</li> <li>Compare numbers.</li> </ul>	<ul style="list-style-type: none"> <li>Compares two small groups of up to five objects, saying when there are the same number of objects in each group, e.g. You've got two, I've got two. Same!</li> </ul>	<ul style="list-style-type: none"> <li>Uses number names and symbols when comparing numbers, showing interest in large numbers</li> <li>Estimates of numbers of things, showing understanding of relative size</li> </ul>
Autumn 3, Autumn 5 Spring 1 Summer 2	Autumn 1, Autumn 5 Spring 1, Spring 3, Spring 4, Spring 5 Summer 1, Summer 6	Autumn 2, Autumn 5	Spring 1, Spring 3, Spring 5 Summer 1, Summer 4

# Counting

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Recite numbers past 5.</li> <li>Say one number for each item in order: 1, 2, 3, 4, 5.</li> </ul>	<ul style="list-style-type: none"> <li>Count beyond ten.</li> </ul>	<ul style="list-style-type: none"> <li>May enjoy counting verbally as far as they can go</li> <li>Points or touches (tags) each item, saying one number for each item, using the stable order of 1,2,3,4,5.</li> <li>Uses some number names and number language within play, and may show fascination with large numbers</li> <li>Begin to recognise numerals 0 to 10</li> </ul>	<ul style="list-style-type: none"> <li>Enjoys reciting numbers from 0 to 10 (and beyond) and back from 10 to 0</li> <li>Increasingly confident at putting numerals in order 0 to 10 (ordinality)</li> </ul>
Autumn 3, Autumn 5 Spring 3, Spring 5 Summer 1	Summer 1, Summer 6	Autumn 3, Autumn 5 Spring 1, Spring 5 Summer 1	Spring 5 Summer 1

# Cardinality

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>Show 'finger numbers' up to 5.</li> </ul>	<ul style="list-style-type: none"> <li>Subitise</li> <li>Link the number symbol (numeral) with its cardinal number value.</li> </ul>	<ul style="list-style-type: none"> <li>Subitises one, two and three objects (without counting)</li> <li>Counts up to five items, recognising that the last number said represents the total counted so far (cardinal principle)</li> <li>Links numerals with amounts up to 5 and maybe beyond</li> <li>Explores using a range of their own marks and signs to which they ascribe mathematical meanings</li> </ul>	<ul style="list-style-type: none"> <li>Engages in subitising numbers to four and maybe five</li> <li>Counts out up to 10 objects from a larger group</li> <li>Matches the numeral with a group of items to show how many there are (up to 10)</li> </ul>
Autumn 3, Autumn 5 Spring 1	Autumn 3, Autumn 5 Spring 1, Spring 3, Spring 5 Summer 6	Autumn 3, Autumn 5 Spring 1 Summer 2	Autumn 5 Spring 1, Spring 3, Spring 5 Summer 4

# Composition

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Solve real world mathematical problems with numbers up to 5.</li> </ul>	<ul style="list-style-type: none"> <li>Understand the 'one more than/one less than' relationship between consecutive numbers.</li> <li>Explore the composition of numbers to 10.</li> <li>Automatically recall number bonds for numbers 0-5 and some to 10.</li> </ul>	<ul style="list-style-type: none"> <li>Through play and exploration, beginning to learn that numbers are made up (composed) of smaller numbers</li> <li>Beginning to use understanding of number to solve practical problems in play and meaningful activities</li> <li>Beginning to recognise that each counting number is one more than the one before</li> <li>Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same</li> </ul>	<ul style="list-style-type: none"> <li>Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects</li> <li>Begins to conceptually subitise larger numbers by subitising smaller groups within the number, e.g. sees six raisins on a plate as three and three</li> <li>In practical activities, adds one and subtracts one with numbers to 10</li> <li>Begins to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"</li> </ul>
Autumn 5 Spring 1	Autumn 3, Autumn 5 Spring 1, Spring 3, Spring 5 Summer 2, Summer 4, Summer 6	Autumn 3, Autumn 5 Spring 1	Autumn 5 Spring 1, Spring 3, Spring 5 Summer 2, Summer 4, Summer 6



# Shape, space and measure

# Spatial awareness

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Compare quantities using language: 'more than', 'fewer than',</li> <li>Understand position through words alone – for example, "The bag is under the table," – with no pointing.</li> <li>Describe a familiar route.</li> <li>Discuss routes and locations, using words like 'in front of' and 'behind'.</li> </ul>	<ul style="list-style-type: none"> <li>Select, rotate and manipulate shapes in order to develop spatial reasoning skills.</li> </ul>	<ul style="list-style-type: none"> <li>Responds to and uses language of position and direction</li> <li>Predicts, moves and rotates objects to fit the space or create the shape they would like</li> </ul>	<ul style="list-style-type: none"> <li>Uses spatial language, including following and giving directions, using relative terms and describing what they see from different viewpoints</li> <li>Investigates turning and flipping objects in order to make shapes fit and create models; predicting and visualising how they will look (spatial reasoning)</li> <li>May enjoy making simple maps of familiar and imaginative environments, with landmarks</li> </ul>
Autumn 2, Autumn 4 Spring 3 Summer 5	Spring 6 Summer 3	Autumn 4 Spring 6 Summer 3	Spring 6 Summer 3, Summer 5

# Shape

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'flat', 'round'.</li> <li>Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.</li> <li>Combine shapes to make new ones – an arch, a bigger triangle, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Compose and decompose shapes so that children recognise a shape can have other shapes <i>within</i> it, just as numbers can.</li> </ul>	<ul style="list-style-type: none"> <li>Chooses items based on their shape which are appropriate for the child's purpose</li> <li>Responds to both informal language and common shape names</li> <li>Shows awareness of shape similarities and differences between objects</li> <li>Enjoys partitioning and combining shapes to make new shapes with 2D and 3D shapes</li> <li>Attempts to create arches and enclosures when building, using trial and improvement to select blocks</li> </ul>	<ul style="list-style-type: none"> <li>Uses informal language and analogies, (e.g. <i>heart-shaped</i> and <i>hand-shaped leaves</i>), as well as mathematical terms to describe shapes.</li> <li>Enjoys composing and decomposing shapes, learning which shapes combine to make other shapes</li> <li>Uses own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build.</li> </ul>
Autumn 4, Autumn 6 Spring 6	Autumn 6 Spring 6 Summer 3	Autumn 6 Spring 6 Summer 3	Autumn 4 Spring 6 Summer 3, Summer 5

# Pattern

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.</li> <li>Extend and create ABAB patterns – stick, leaf, stick, leaf.</li> <li>Notice and correct an error in a repeating pattern.</li> </ul>	<ul style="list-style-type: none"> <li>Continue, copy and create repeating patterns.</li> </ul>	<ul style="list-style-type: none"> <li>Creates their own spatial patterns showing some organisation or regularity</li> <li>Explores and adds to simple linear patterns of two or three repeating items, e.g. stick, leaf (AB) or stick, leaf, stone (ABC)</li> <li>Joins in with simple patterns in sounds, objects, games and stories dance and movement, predicting what comes next</li> </ul>	<ul style="list-style-type: none"> <li>Spots patterns in the environment, beginning to identify the pattern "rule"</li> <li>Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat</li> </ul>
Autumn 2 Spring 6	Autumn 2 Spring 6 Summer 5	Autumn 2	Autumn 1 Spring 6 Summer 5

# Measure

Development matters		Birth to 5 matters	
3 and 4 year olds	Reception	Range 5	Range 6
<ul style="list-style-type: none"> <li>• Make comparisons between objects relating to size, length, weight and capacity.</li> <li>• Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'</li> </ul>	<ul style="list-style-type: none"> <li>• Compare length, weight and capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• In meaningful contexts, finds the longer or shorter, heavier or lighter and more/less full of two items</li> <li>• Recalls a sequence of events in everyday life and stories.</li> </ul>	<ul style="list-style-type: none"> <li>• Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy</li> <li>• Becomes familiar with measuring tools in everyday experiences and play</li> <li>• Is increasingly able to order and sequence events using everyday language related to time</li> <li>• Beginning to experience measuring time with timers and calendars</li> </ul>
Autumn 2 Spring 2, Spring 4 Summer 5	Spring 2, Spring 4 Summer 6	Autumn 2, Autumn 6 Spring 4	Autumn 6 Spring 2, Spring 4 Summer 6



# Reception Mastering Number Overview -Aut Term

Pupils will build on previous experiences of number from their home and nursery environments, and further develop their subitising and counting skills. They will explore the composition of numbers within 5. They will begin to compare sets of objects and use the language of comparison. Pupils will:

- identify when a set can be subitised and when counting is needed
- subitise different arrangements, both unstructured and structured, including using the Hungarian number frame
- make different arrangements of numbers within 5 and talk about what they can see, to develop their conceptual subitising skills
- spot smaller numbers 'hiding' inside larger numbers
- connect quantities and numbers to finger patterns and explore different ways of representing numbers on their fingers
- hear and join in with the counting sequence, and connect this to the 'staircase' pattern of the counting numbers, seeing that each number is made of one more than the previous number
- develop counting skills and knowledge, including: that the last number in the count tells us 'how many' (cardinality); to be accurate in counting, each thing must be counted once and once only and in any order; the need for 1:1 correspondence; understanding that anything can be counted, including actions and sounds
- compare sets of objects by matching
- begin to develop the language of 'whole' when talking about objects which have parts

# Reception Mastering Number Overview -Spr Term

Pupils will continue to develop their subitising and counting skills and explore the composition of numbers within and beyond 5. They will begin to identify when two sets are equal or unequal and connect two equal groups to doubles. They will begin to connect quantities to numerals.

Pupils will:

- continue to develop their subitising skills for numbers within and beyond 5, and increasingly connect quantities to numerals
- begin to identify missing parts for numbers within 5
- explore the structure of the numbers 6 and 7 as '5 and a bit' and connect this to finger patterns and the Hungarian number frame
- focus on equal and unequal groups when comparing numbers
- understand that two equal groups can be called a 'double' and connect this to finger patterns • sort odd and even numbers according to their 'shape'
- continue to develop their understanding of the counting sequence and link cardinality and ordinality through the 'staircase' pattern • order numbers and play track games
- join in with verbal counts beyond 20, hearing the repeated pattern within the counting numbers

# Reception Mastering Number Overview -Sum Term

Pupils will consolidate their counting skills, counting to larger numbers and developing a wider range of counting strategies. They will secure knowledge of number facts through varied practice.

Pupils will:

- continue to develop their counting skills, counting larger sets as well as counting actions and sounds
- explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame • compare quantities and numbers, including sets of objects which have different attributes
- continue to develop a sense of magnitude, e.g. knowing that 8 is quite a lot more than 2, but 4 is only a little bit more than 2
- begin to generalise about 'one more than' and 'one less than' numbers within 10 • continue to identify when sets can be subitised and when counting is necessary
- develop conceptual subitising skills including when using a rekenrek

# YEAR I

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# YEAR 1 Overview

*\*Adjustments made-Year 1 will be planning to cover 'Geometry-Space' in Aut 1 and bring 'Place Value (Within 20)' forward into Aut 2.*

## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value (within 10)					Number Addition and subtraction (within 10)					Geometry Shape	Consolidation
Spring	Number Place value (within 20)			Number Addition and subtraction (within 20)			Number Place value (within 50)		Measurement Length and height		Measurement Mass and volume	
Summer	Number Multiplication and division			Number Fractions		Geometry Position and direction	Number Place value (within 100)		Measurement Money	Measurement Time		Consolidation

# Y1 Mastering Number Overview -Aut Term

**Pupils will have an opportunity to consolidate the Early Learning Goals and continue to explore the composition of numbers within 10, and the position of these numbers in the linear number system.**

Pupils will: • subitise within 5, including when using a rekenrek, and re-cap the composition of 5

- develop their understanding of the numbers 6 to 9 using the '5 and a bit' structure
- compare numbers within 10 and use precise mathematical language when doing so
- re-cap the order of numbers within 10 and connect this to '1 more' and '1 less' than a given number
- explore the structure of even numbers (including that even numbers can be composed by doubling any number, and can be composed of 2s)
- explore the structure of the odd numbers as being composed of 2s and 1 more • explore the composition of each of the numbers 6, 8, and 10
- explore number tracks and number lines and identify the differences between them

***This term will build and consolidate the Early Learning Goals and support the teaching and consolidation of the following RtP criteria: • 1AS-1 • 1NF-1 • 1NPV-2***



# Y1 Mastering Number Overview -Spr Term

Pupils will continue to explore the composition of numbers within 10 and explore addition and subtraction structures and the related language (without the use of symbols).

Pupils will:

- explore the composition of each of the numbers 7 and 9
- explore the composition of odd and even numbers, seeing that even numbers can be made of two odd or two even parts, and that odd numbers can be composed of one odd part and one even part
- identify the number that is two more or two less than a given odd or even number, identifying that two more/ less than an odd number is the next/ previous odd number, and two more/ less than an even number is the next/ previous even number explore the aggregation and partitioning structures of addition and subtraction through systematically partitioning and re-combining numbers within 10 and connecting this to the part-part-whole diagram, including using the language of parts and wholes
- explore the augmentation and reduction structures of addition and reduction using number stories, including introducing the 'first, then, now' language structure

***This term will particularly support the teaching and consolidation of the following RtP criteria:***

- **1AS-1 • 1NF-1**

# Y1 Mastering Number Overview -Sum Term

Pupils will explore the composition of numbers within 20 and their position in the linear number system. They will connect addition and subtraction expressions and equations to 'number stories').

Pupils will:

- explore the composition of the numbers 11 to 19 as '10 and a bit' and compare numbers within 20
- connect the composition of the numbers 11 to 19 to their position in the linear number system, including identifying the midpoints of 5, 10 and 15
- compare numbers within 20
- understand how addition and subtraction equations can represent previously explored structures of addition and subtraction (aggregation/ partitioning/ augmentation/ reduction)
- practise retrieving previously taught facts and reason about these

***This term will particularly support the teaching and consolidation of the following RtP criteria:***

- **1AS-2, 1NF-1, 1NPV-2**

## Y1 Aut 1- - Maths

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b>Number – Number and Place Value</b>            *count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number            *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            *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 and write numbers from 1 to 20 in numerals and words.</p> <p><b>Number – Addition and Subtraction</b>            Pupils should be taught to:            *read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs            *represent and use number bonds and related subtraction facts within 20            *add and subtract one-digit and two-digit numbers to 20, including zero            *solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math>.</p> <p><b>Geometry – properties of shape</b>            Pupils should be taught to:            * recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles]            * 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].</p>	<p>Topics build on a sequence of learning where mathematical concepts are connected</p> <p>Children will explore maths and present their findings not only in a written form but also visually</p> <p>Children will have a sound knowledge of subject vocabulary and will be able to use this in order to communicate and justify their ideas</p>	<p><b>Number and Place Value</b>            Count to and across 10, forwards and backwards, beginning with 0 or 1, or from any given number            Count, read and write numbers to 10 in numerals            Given a number, identify one more and one less            Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than, most, least</p> <p><b>Geometry – properties of shape</b>            Recognise and name common 2 - D shapes, including: (for example, rectangles (including squares), circles and triangles)            Recognise and name common 3 - D shapes, including: (for example, cuboids (including cubes), pyramids and spheres.)</p> <p><b>Addition and Subtraction</b>            Represent and use number bonds and related subtraction facts within 10            Read, write and interpret mathematical statements involving addition (+), subtraction ( - ) and equals (=) signs            Add and subtract one -digit and two digit numbers to 10, including zero            Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math></p>	<p><b>Represent-</b> to show things in different ways  <b>Total-</b> the whole or complete amount  <b>Numeral-</b> a mathematical way to say number.  <b>Greater-</b> more/ less</p> <p><b>Sequence-</b> a list of things in order  <b>Difference-</b> the numerical difference between two numbers or sets of objects  <b>Equal-</b> having the same value as  <b>Part-</b> one of two or more smaller units that make up a whole  <b>Whole-</b> a complete unit  <b>Number bond-</b> pairs of numbers that add together to make a given number</p> <p><b>Face-</b> Any of the individual flat surfaces of a solid object.  <b>Sides-</b> One of the line segments that make a flat (2-dimensional) shape</p>	<p><b>1. How can we represent numbers to 10?</b>            Use a wide range of practical manipulatives to sort, count and represent amounts. Children compare different representations – which are the easiest to read and recognise? Children invent their own ways to represent numbers - Can they identify representations that are not accurate? Using their prior knowledge the children sort and group manipulatives to represent  <i>Broaden – How can you sort and group objects and amounts? What strategies can you use to count? What resources can you use to represent amounts?</i></p> <p><b>2. How can we find 1 more and 1 less?</b>            Count forwards and backwards to identify numbers as we count along number tracks and pictorial number tracks. Apply understanding to complete missing numbers along the tracks. Find 1 more than groups of objects and take 1 away / cross out to find 1 less  <i>Enrich – How can you use a number track to find one more, one less? What strategies can you use to help you find the missing numbers?</i></p> <p><b>3. How can we compare numbers and amounts?</b>            Identify numbers, number words and amounts of objects in a group using practical resources. Compare groups of objects / numbers using words and symbols. Apply understanding to predict how many could be in a group that is greater or smaller than a given group.  <i>Expand – What do the symbols mean when comparing? Can you compare amounts and numerals?</i></p> <p><b>4. How can we order numbers and amounts?</b>            Apply knowledge of greater and less to compare numbers /amounts to order cards showing images (from smallest to largest and in reverse). Repeat with number cards. Use number lines and number tracks to support ordering numbers and complete missing numbers. Identify ordinal numbers.  <i>Challenge – Can you order larger numbers and amounts?</i></p> <p><b>5. What do 2d and 3d shapes look like?</b>            Use shapes and objects to identify, match and name 2d and 3d shapes. identify and describe shape properties. Trace around and label shapes. create patterns with shapes and describe and continue/complete patterns. (2d 3d shape names – circle rectangle, triangle, square, cone, cube, pyramid, cylinder, sphere, cuboid, )  <i>Enrich – What is a 2D shape? What is a 3D shape? Can you identify 2D shapes within 3D shapes?</i></p> <p><b>6. Introduce and use part whole models. Begin to use the addition symbol</b>            Introduce part whole model. Explore adding parts to make whole. Explore finding a missing part. Identify addition symbol. Use a range of practical resources to explore the model and simple addition.  <i>Challenge – How can we find the missing number in the addition calculation using the part whole model?</i></p> <p><b>7. Number bonds for and within 10 and fact families.</b>            Use practical resources to make number bonds. Look at and identify patterns made. Use Numicon and the ten frame to select pairs of numbers to make bonds to 10. Apply understanding of addition to create simple fact families.  <i>Challenge – Can you use number bonds to 10 to find number bonds to 20?</i></p>

## Year 1-Aut 2– Maths (Addition and Subtraction Week 1-3)

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b>Addition &amp; Subtraction:</b></p> <ul style="list-style-type: none"> <li>• read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> <li>• represent and use number bonds and related subtraction facts within 20</li> <li>• add and subtract one-digit and two-digit numbers to 20, including zero</li> <li>• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math>.</li> </ul>	<p><b>Sequenced steps-</b> where mathematical concepts are connected for depth of understanding</p> <p>Adopting the <b>mastery approach</b></p> <p><b>Calculate mentally and in written form-</b> continually revisited and consolidated</p> <p><b>Gaps in learning</b> will be identified and addressed quickly</p> <p><b>Interleaved learning –</b> where previous linked learning is referred to when a new idea is introduced</p> <p><b>CPA</b> approach</p> <p>Sound knowledge of <b>subject vocabulary</b></p>	<p>• <b>1NF-1:</b> Represent and use number bonds and related subtraction facts within 20 <i>Develop fluency in addition and subtraction facts within 10.</i></p> <ul style="list-style-type: none"> <li>• <b>1AS-1:</b> <i>Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.</i></li> <li>• <b>1AS-2:</b> Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs, <i>and relate additive expressions and equations to real-life contexts.</i></li> </ul>	<p><b>Addition-</b> Finding the total, or sum, by combining two or more numbers.</p> <p><b>Subtract-</b> Taking one number away from another. This can be written: <math>5 - 2 = 3</math>.</p> <p><b>Equals / Is the same as-</b> Exactly the same amount or value</p> <p><b>Number bonds/pairs</b> -pairs of numbers that make up a given number</p> <p><b>Missing numbers in a sequence-</b> numbers that got missed in the given series of numbers with similar differences among them.</p> <p><b>Sum/ Total-</b> The result of adding two or more numbers</p>	<p><b>1AS-1 PP</b> Compose and partition numbers to 10</p> <p><b>1AS-2 PP</b> Read, write and interpret additive equations</p> <p><b>1. How can I solve a number problem?</b> Children should apply their understanding of number bonds to solve missing number problems. Children should also be exposed to problems with one part and the whole being the same so they understand the role of zero. <i>Extend – Can you write a number sentence for a word problem? Can you write a 'first, then and now' story for the picture provided?</i></p> <p><b>2. What strategies can I use to subtract?</b> Children are introduced to the language of subtraction and then the subtraction symbol. They will use concrete and pictorial representations. They are introduced to subtraction by partitioning, crossing out and counting back. <i>Broaden – How can you subtract using a number line? What number do you need to start on? Which way are you jumping?</i></p> <p><b>3. What is a fact family?</b> Children will link addition and subtraction facts for the first time. Children count backwards to subtract. Children explore finding the difference as a form of subtraction. <i>Enrich – How many subtraction sentences can you write? How many addition sentences can you write? What is the same and what is different about the number sentences?</i></p>

## Year 1 Aut 2 – Maths (Place Value Week 4&5)

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<ul style="list-style-type: none"> <li>•count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>•count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens</li> <li>•identify and represent numbers using objects and pictorial representations</li> <li>•read and write numbers from 1 to 20 in numerals and words.</li> <li>•given a number, identify one more and one less</li> </ul>	<p><b>Sequenced steps-</b> where mathematical concepts are connected for depth of understanding</p> <p>Adopting the <b>mastery approach</b></p> <p><b>Gaps in learning</b> will be identified and addressed quickly</p> <p><b>Interleaved learning –</b> _where previous linked learning is referred to when a new idea is introduced</p> <p><b>CPA</b> approach</p> <p>Sound knowledge of <b>subject vocabulary</b></p>	<ul style="list-style-type: none"> <li>•<b>1NPV-1</b> Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>•</li> <li>•<b>1NPV-2-</b> Reason about the location of numbers to 20 within the linear number system, including comparing using <math>&lt;</math> <math>&gt;</math> and <math>=</math></li> </ul>	<p><b>Numeral-</b><i>a symbol or name that stands for a number e.g. 3, 49 and twelve are all numerals</i></p> <p><b>Equal to, equivalent to -</b> <i>exactly the same amount or value (symbol = )</i></p>	<p><b>1.How can I represent teen numbers?</b></p> <p>Children will build upon their knowledge of counting forwards and backwards and introduce numbers 11-20. Children will explore the suffix teen and what this means. Children will match representations and numbers in concrete and pictorial ways. Children will build on their language of more and less to apply their skills to find 1 more and 1 less than a number or amount. Clear modelling will be used to ensure understanding that 1 more is 1 one more rather than 1 ten. <i>Extend – Can you represent teen numbers using base ten? How many tens and ones? Can you find one more or less of a given teen number?</i></p> <p><b>2. What is the same and what is different?</b></p> <p>Once confident exploring and making numbers children will apply their understanding to compare numbers. They will continue to use the language greater than, less than, equal to. Children will apply their understanding of difference to find how many more.</p> <p>Children will build on ordering numbers to 10 applying this to numbers up to 20. Children will order 3 groups of objects to support them to order 3 abstract numbers. Children will order abstract numbers supported by concrete objects or drawing pictorially. <i>Challenge – Can you compare teen numbers and amounts using the correct language or symbols?</i></p>

## Year 1-Aut 2 – Maths (Measures Week 6&7)

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
Compare, describe and solve practical problems for lengths, heights, weight/mass, capacity and volume	<p>Topics will be broken down into manageable steps that build on a sequence of learning where mathematical concepts are connected in order to ensure there is a real depth of understanding</p> <p>Teaching will ensure that pupils will have the necessary appropriate knowledge of facts, concepts and procedures required to solve associated mathematical problems and reasoning activities of a more complex nature</p> <p>Children will have a sound knowledge of subject vocabulary and will be able to use this in order to communicate and justify their ideas</p>	<ul style="list-style-type: none"> <li>• Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)</li> <li>• Compare, describe and solve practical problems for: mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume</li> </ul>	<p><b>Compare</b> – look at the differences</p> <p><b>Length</b> – how long something is</p> <p><b>Height</b> – how high something is</p> <p><b>Mass</b> – the amount an object contains</p> <p><b>Weight</b> – how heavy something is</p> <p><b>Volume</b> – how much space is in an object</p> <p><b>Capacity</b> – the amount that something can hold</p>	<p><b>1. How can I measure length and height?</b> Children use the language of length such as long, longer, short, shorter, tall, taller. To understand that height is a form of length. Talk about which is longer /shorter. Taller / shorter Use language to compare different objects. <i>Broaden – Why is height a form of length? What is similar and what is different?</i></p> <p><b>2. How can I measure weight and capacity?</b> Children introduced to weight and mass for first time. Explore their understanding of heavy and light from own experiences. Children hold objects and describe using –heavy, light, heavier than, lighter than. Compare a range of objects. Explore the common misconception that larger = heavier. Use a balance scale to compare. Explore the concept of volume in a practical way using a variety of containers. Compare volume of a container using vocab- full empty, nearly full, nearly empty. Compare the capacity of containers. Compare largest and smallest capacity. <i>Enrich – If an object is bigger than another object, does that mean it will weigh more? If a container is taller than another, will it have a larger capacity?</i></p>



# Year 1-Spr 1 – Maths (Measures Week 1-3)

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Compare, describe and solve practical problems for lengths, heights, weight/mass, capacity and volume</p>	<p><b><u>Sequenced steps-</u></b> where mathematical concepts are connected for depth of understanding</p> <p>Adopting the <b><u>mastery approach</u></b></p> <p><b><u>Gaps in learning</u></b> will be identified and addressed quickly</p> <p><b><u>Interleaved learning</u></b> – where previous linked learning is referred to when a new idea is introduced</p> <p><b><u>CPA</u></b> approach</p> <p>Sound knowledge of <b><u>subject vocabulary</u></b></p>	<ul style="list-style-type: none"> <li>Compare, describe and solve practical problems for: mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume</li> <li>Measure and begin to record the following: Lengths and heights, mass and weight, capacity and volume</li> </ul>	<p>Length – how long or short something is</p> <p>Height – how tall or short something is</p> <p>Compare – look at the differences</p> <p>Mass – the amount an object contains</p> <p>Weight – how heavy something is</p> <p>Volume – how much space is in an object</p> <p>Capacity – the amount that something can hold</p>	<p><b>1. How can we measure the length and height of objects?</b>  Children compare lengths and heights of objects using the correct language for both. Children to use non-standard units to measure and record the length of everyday objects. Children to use a ruler to measure and record objects in centimetres. Children should also be exposed to objects that have the same length or height.  <i>Extend – Children to compare more than two items and put them in order of length or height. Which one is the longest? Which one is the shortest? How do you know it is longer/shorter?</i></p> <p><b>2. How can mass be measured and compared?</b>  Children are introduced to mass, using the correct language to describe objects measured. Children will hold objects and describe them using vocabulary such as heavy, light, heavier than, lighter than before using the scales to check. Children to use non-standard units to balance the scales and record the mass of an object. Children to compare the objects they have weighed and use the language of ‘heavier’, ‘lighter’ and ‘equal to’. Children can then use the symbols to compare these objects by weight.  <i>Broaden – If the object is large will that mean that it is heavy? If the object is small will that mean that it is light?</i></p> <p><b>3. How can we measure capacity and volume?</b>  Children are introduced to volume and capacity and the language used to describe them. They explore the concept in a practical way, using a variety of containers and non-standard units of measure. They compare the volume in a container by describing whether it is full, nearly full, empty or nearly empty. Children compare the capacity of different containers using non-standard units of measure. They use ‘more’, ‘less’ and ‘equal to’ to compare as well as the symbols and =.  <i>Challenge – Can you put the containers in order of capacity?</i></p>

# Year 1-Spr 1 – Maths (Measures Addition wks 4-5)

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b><u>Addition &amp; Subtraction:</u></b></p> <ul style="list-style-type: none"> <li>read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> <li>represent and use number bonds and related subtraction facts within 20</li> <li>add and subtract one-digit and two-digit numbers to 20, including zero</li> <li>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math>.</li> </ul>	<p><b><u>Sequenced steps-</u></b> where mathematical concepts are connected for depth of understanding</p> <p>Adopting the <b><u>mastery approach</u></b></p> <p><b><u>Calculate mentally and in written form-</u></b> continually revisited and consolidated</p> <p><b><u>Gaps in learning</u></b> will be identified and addressed quickly</p> <p><b><u>Interleaved learning</u></b> – where previous linked learning is referred to when a new idea is introduced</p> <p><b><u>CPA</u></b> approach</p> <p>Sound knowledge of <b><u>subject vocabulary</u></b></p>	<ul style="list-style-type: none"> <li><b><i>1NF-1:</i></b> Represent and use number bonds and related subtraction facts within 20 <i>Develop fluency in addition and subtraction facts within 10.</i></li> <li><b><i>1AS-1:</i></b> <i>Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.</i></li> <li><b><i>1AS-2:</i></b> Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs, <i>and relate additive expressions and equations to real-life contexts.</i></li> </ul> <p>1AS-1 PP Compose and partition numbers to 10</p> <p>1AS-2 PP Read, write and interpret additive equations</p>	<p><b>Addition-</b> Finding the total, or sum, by combining two or more numbers.</p> <p><b>Subtract-</b> Taking one number away from another. This can be written: <math>5 - 2 = 3</math>.</p> <p><b>Equals / Is the same as-</b> Exactly the same amount or value</p> <p><b>Number bonds/pairs</b> -pairs of numbers that make up a given number</p> <p><b>Sum/ Total-</b>The result of adding two or more numbers</p>	<p><b>1. What strategies can we use to add to 20?</b> Children explore addition by counting on from a given number. Children see that working systematically helps them to find all the possible number bonds to 20. Children to use their knowledge of number bonds to 10 to find number bonds to 20. Children will be encouraged to see the link between bonds to 10 and bonds to 20 and reinforces their understanding of place value.</p> <p>Children add numbers within 20 using their knowledge of number bonds. It is important that children work practically using ten frames and/or number lines to help them see how number bonds to 10 can help them calculate. They will move towards using this as a mental strategy.</p> <p><i>Broaden – Create links to prior learning</i> <i>What is the same and what is different about 4 and 14? If you know that 4 plus 2 is equal to 16, how can you use this to work out 14 plus 2? What do you notice about <math>14 + 2</math> and <math>12 + 4</math>? How many tens are there in each addition? How many ones are there?</i> <i>Challenge – Children to explore missing number problems.</i></p>

# YEAR 2

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# YEAR 2 Overview

## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value				Number Addition and subtraction				Geometry Shape			
Spring	Measurement Money	Number Multiplication and division					Measurement Length and height		Measurement Mass, capacity and temperature			
Summer	Number Fractions			Measurement Time		Statistics		Geometry Position and direction		Consolidation		

# Y2 Mastering Number Overview -Aut Term

**Pupils will have an opportunity to consolidate their understanding and recall of number bonds within 10; they will re-cap the composition of the numbers 11 to 20 and reason about their position within the linear number system.**

Pupils will: • review the composition of the numbers 6 to 9 as '5 and a bit'

- compare numbers using the language of comparison and use the symbols  $<$   $>$   $=$
- review the structure of even numbers (including exploring how even numbers can be composed of two odd parts or two even parts) and the composition of each of 6, 8 and 10
- review the structure of odd numbers (including exploring how odd numbers can be composed of one odd part and one even part) and the composition of each of 7 and 9
- consolidate their understanding of the numbers 10 and 20 as '10 and a bit'
- consolidate their understanding of the linear number system to 20 and reason about midpoints

***This term will particularly support the teaching and consolidation of the following RtP criteria:***

- **1NPV-2** • **2NF-1**

# Y2 Mastering Number Overview -Spr Term

Pupils will have an opportunity to use their knowledge of the composition of numbers within 10 to calculate within 20; they will explore the links between the numbers in the linear number system within 10 to numbers within 100, focusing on multiples of 10 and the midpoint of 50.

Pupils will:

- explore how the numbers 6 to 9 can be doubled using the '5 and a bit' and '10 and a bit' structure
- use doubles to calculate near doubles
- use bonds of 10 to reason about bonds of 20, in which the given addend is greater than 10
- use known number bonds within 10 to calculate within 20, working within the 10-boundary
- use their knowledge of bonds of 10 to find three addends that sum to 10
- use their knowledge of the composition of numbers within 20 to add and subtract across the 10-boundary
- use their understanding of the linear number system to 10 to position multiples of 10 on a 0 - 100 number line and reason about midpoints

***This term will particularly support the teaching and consolidation of the following RtP criteria:***

***2NPV-2 • 2NF-1 • 2AS-1***



# Y2 Mastering Number Overview –Sum Term

Pupils will have further opportunities to use their knowledge of the composition of numbers within 10 to calculate within 20 and to reason about equations and inequalities.

Pupils will:

- continue to explore a range of strategies to subtract across the 10-boundary
- review bonds of 20 in which the given addend is greater than 10, and reason about bonds of 20, in which the given addend is less than 10
- practise previously explored strategies to support their reasoning about inequalities and equations
- review doubles and near doubles and transform additions in which two addends are adjacent odd/ even numbers into doubles
- consolidate previously taught facts and strategies through continued, varied practice

***This term will particularly support the teaching and consolidation of the following RtP criteria:***

- ***2NF-1 • 2AS-1 • 2AS-2***

# Year 2 – Aut 1 Maths

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b>-Become fluent in the fundamentals of mathematics:</b> ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources.</p> <p><b>Pupils should develop their ability to recognise, describe, draw, compare and sort</b> different shapes and use the related vocabulary.</p> <p><b>Reason mathematically</b> by following a line of enquiry.</p> <p><b>-To problem solve</b> Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling.</p>	<p>-Mathematical concepts are connected in order to ensure there is a real depth of understanding</p> <p>-Adopting the mastery approach</p> <p>-The ability to calculate both mentally and in written form</p> <p>-To rapidly recall key facts</p> <p>-Interleaved learning and regular repetition to previously linked learning and then referred to when a new idea is introduced.</p> <p>-Children will have appropriate knowledge of facts, concepts and procedures required to solve associated mathematical problems and reasoning activities of a more complex nature</p> <p>-Gaps in learning will be identified and addressed quickly</p> <p>-Children will explore maths and present their findings in a written and visual form; concrete, pictorial, abstract (CPA).</p>	<p><b>Place Value</b> - 2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.</p> <p>2NPV-2 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10</p> <ul style="list-style-type: none"> <li>• I can read and write numbers to 100 in words</li> <li>• I can identify and recognise the value of each digit in two-digit numbers</li> <li>• I can describe and represent numbers using different representations including the number line.</li> <li>• I can estimate numbers using different representations including the number line.</li> <li>• I can apply my understanding of number by comparing and order numbers from 0 up to 100; use &lt;, &gt; and = signs</li> <li>• I can apply my understanding of place value and number facts to solve problems.</li> <li>• I can recall counting in steps of 2, 3 and 5 from 0, and in tens from any number, forwards and backwards.</li> <li>• To argue their reasoning when solving and explaining problems.</li> </ul> <p><b>Addition and Subtraction</b></p> <p>2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.</p> <p>2AS-1 Add and subtract across 10</p> <p>2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.</p> <ul style="list-style-type: none"> <li>• I can recall and complete addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</li> <li>• I can 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</li> <li>• I can show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.</li> </ul>	<p><i>Hundred</i> <i>Tens</i> <i>Ones</i> <i>Zero</i> <i>Place value</i> <i>Greater than</i> <i>Less than</i> <i>Partition</i> <i>Represent</i> <i>Compare</i> <i>Reason</i> <i>Explain</i></p> <p><i>Add</i> <i>Total</i> <i>Equals</i> <i>Partition</i> <i>Part part</i> <i>whole</i> <i>Combine</i> <i>Increase</i> <i>Count on</i> <i>Altogether</i> <i>Subtract</i> <i>Difference</i> <i>Count back</i> <i>Decrease</i> <i>Takeaway</i> <i>Less</i></p>	<p><b>Place Value</b> - Children to represent numbers to 100 using manipulatives including base ten as well as jottings/numbers on a part whole model/place value chart. Children will then demonstrate their understanding of place value by partitioning numbers to 100 and flexibly partition to the tens to numbers to 100. They will then be shown how to write the flexible partitions in expanded form – <a href="#">Challenge – How many different ways can you partition the number ? and what do you notice?</a></p> <p>The children will then use their understanding of place value to identify 10s on the number line to 100, 10s and 1s on the number line to 100 and then estimate numbers on the number line – <a href="#">Broaden – Explain how can you estimate a number when there are missing numbers</a></p> <p>The children will then begin to compare objects and numbers to 100 and order amounts. <a href="#">Challenge - When comparing numbers, the number with more ones is always the greater number. Explain your reasoning.</a></p> <p>The children will then learn to count in 2's, 5's, 10's and 3's and begin to identify patterns. <a href="#">Expand – Is this true, sometimes true or never true? - When counting in 5s from zero, the numbers you say are even? - Assessment – WR Entry and End Block Place Value</a></p> <p><b>Addition and Subtraction</b> - Children will begin by identifying number bonds within 10. They will see ten frames and other presentations to help complete a range of number bonds calculations. Children to use resources to make fact families - addition and subtraction bonds to 20 and record the calculations. Show strategies to enable to be able to check calculations. <a href="#">Broaden - If <math>3 + 5 = 8</math>, what is <math>30 + 50</math>? How do you know?</a></p> <p>Children will use previous strategies taught to derive and use related facts for 100. The children will then use strategies to add and subtract 1-digit numbers from 2-digit numbers. The children will then recap their understanding of doubles/number bonds to 10 to add three-digit numbers – <a href="#">Challenge - Investigate the 3 different digits that could be used from 1-9 that total 21</a></p> <p><a href="#">Assessment – WR Entry (End Block – to be completed Aut 2)</a></p>

# Year 2 –Aut 2 Maths

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b>-Become fluent in the fundamentals of mathematics:</b> ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources.</p> <p><b>Pupils should develop their ability to recognise, describe, draw, compare and sort</b> different shapes and use the related vocabulary.</p> <p><b>Reason mathematically</b> by following a line of enquiry.</p> <p><b>-To problem solve</b> Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling.</p>	<p><b>Sequenced steps</b> Mathematical concepts are connected in order to ensure there is a depth of understanding</p> <p>-Adopting the <b>mastery approach</b></p> <p><b>Calculate mentally</b> and in written form- continually revisited and consolidated</p> <p><b>Interleaved learning</b> where previously linked learning and then referred to when a new idea is introduced.</p> <p>Solve problems and complete reasoning activities- to solve associated mathematical problems and reasoning activities of a more complex nature</p> <p><b>CPA Approach</b> (Concrete, pictorial, abstract)</p> <p>Sound knowledge and use of <b>subject vocabulary</b></p>	<p><b>Number: Addition and Subtraction</b> 2AS-1 - Add and subtract across 10 2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?". 2AS-3 - Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two digit number. 2AS-4 - Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.</p> <p><b>Number Facts</b> 2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.</p> <p><b>Shape:</b> 2G-1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.</p>	<p><b>Addition and subtraction:</b> Addition, make, sum, total altogether double one more, two more ... ten more ... one hundred more subtract take away one less, two less, ten less ... one hundred less difference between equals is the same as number bonds/pairs/facts tens boundary</p> <p><b>Shape:</b> 2-D shape - corner, side point, pointed rectangle (including square), rectangular circle, circular triangle, triangular pentagon hexagon octagon</p> <p>3-D shape - face, edge, vertex, vertices cube, cuboid pyramid sphere cone cylinder Symmetry</p>	<p><b>Number: Number facts</b> - Recap and revisit numbers Bonds to and within 10 and 20 (use rekenrek to support) When looking at number bonds to 20, focus on fact families and how to record. Show how to use Related facts to solve calculations and move onto to solving numbers bond to 100. Move onto then adding and subtracting a 1's number a 2-digit number, not crossing 10. Use mental strategies as well as manipulatives. <b>Challenge – what is the most effective way to solve the calculation?</b></p> <p><b>Addition + Subtraction:</b> Children to be shown how to add by making 10 first and then use to identify number bonds for 10 when adding three 1-digit numbers. <b>Broaden – Does it matter what order you add the numbers in?</b> Move onto adding to the next lot of 10 and then move onto adding by crossing 10. Repeat for subtraction as follows: across 10 , from a 10, subtract a 1-digit number from a 2-digit number (across a 10). The children will identify 10 more, 10 less from any given number and then add and subtract 10s. <b>Expand – Is it true that the ones number doesn't change when finding 10 more or 10 less? Prove it.</b> Children will start to use manipulatives and jottings to add two 2-digit numbers (not across a 10), add two 2-digit numbers (across a 10), subtract two 2-digit numbers (not across a 10) Subtract two 2-digit numbers (across a 10). They will then apply their understanding to solve mixed addition and subtraction and compare number sentences Missing number problems. <b>Challenge – Tom goes to the shop and had 89p to spend. He leaves the shop with change that is less than 8p but greater than 3p. Investigate the different items he could have bought.</b> <b>End Block Assessment – Addition and Subtraction</b></p> <p><b>Geometry: Shape</b></p> <ul style="list-style-type: none"> <li>• Recognise 2-D and 3-D shapes - Children also need to be able to recognise 2-D shapes in different orientations and proportions.</li> <li>• Count sides on 2-D shapes Children also need to understand that not all same-sided shapes look the same, such as irregular 2-D shapes. <b>Explore – do shapes with the same number of sides always look the same?</b></li> <li>• Count vertices on 2-D shapes - Introduce the terms vertex and vertices. Understand that a vertex is where two lines meet at a point. Ensure from this point forwards the word vertex is used in place of corner throughout all content. <b>Explore – Do shapes always have the same number of sides and vertices</b></li> <li>• Draw 2-D shapes/Sort 2-D shapes</li> <li>• Count faces/edges/vertices on 3-D shapes and use to sort 3-D shapes – <b>Challenge – Dora wants to put a sticker on each face of some cubes. She has 60 stickers. How many cubes can she cover in stickers?</b></li> <li>• Make patterns with 2-d and 3-D shapes</li> <li>• compare and sort common 2-D shapes and everyday objects recognise and name common 3- D shapes/compare and sort common 3-D shapes and everyday objects – <b>Expand – Can you explain what is the same and different between two different 3d shapes?</b></li> </ul> <p>Introduce concept of vertical lines of symmetry – children to identify vertical lines of symmetry in shapes by folding and using mirrors. Use lines of symmetry to Complete shapes. <b>Extend – Are there other lines of symmetry?</b></p> <p><b>Assessment – Entry and Exit – Shape</b></p>

# Year 2- Spr 1- Maths

NC PoS	Key Concepts What are the links?	Key Competencies What are we learning and measuring?	Key Vocabulary What are we hearing?	Key Activities What are we doing? (Context)
<p><b>-Become fluent in the fundamentals of mathematics:</b> ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources.</p> <p><b>Pupils should develop their ability to recognise, describe, draw, compare and sort</b> different shapes and use the related vocabulary.</p> <p><b>Reason mathematically</b> by following a line of enquiry.  <b>-To problem solve</b> Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling.</p>	<p><b>Sequenced steps</b> Mathematical concepts are connected in order to ensure there is a depth of understanding</p> <p>-Adopting the <b>mastery approach</b></p> <p><b>Calculate mentally</b> and in written form- continually revisited and consolidated</p> <p><b>Interleaved learning</b> where previously linked learning and then referred to when a new idea is introduced.</p> <p>Solve problems and complete reasoning activities- to solve associated mathematical problems and reasoning activities of a more complex nature</p> <p><b>CPA Approach</b> (Concrete, pictorial, abstract)</p> <p>Sound knowledge and use of <b>subject vocabulary</b></p>	<p><b>Shape:</b> 2G-1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.</p> <p><b>Measurement: Money</b>  2NPV-2 - Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.  2AS-2 - Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more....?".</p> <p><b>Number: Multiplication</b>  2MD-1 - Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.  2MD - 2 - Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).</p>	<p><b>Shape: Sides</b> - individual lines that make up a 2D shape  <b>Vertices</b>- corners where the edges/sides meet  <b>2D</b> - two-dimensional, only have two dimensions: length and width.  <b>Face</b> - the flat surfaces.  <b>Edge</b> - the place where two faces meet.  <b>Vertex</b> - the corner where two or more edges/sides meet.  <b>3D</b>-3D shapes have three dimensions: length, width and height.</p> <p><b>Money: buy, bought</b> – in exchange for payment  <b>Sell, sold</b> - give or hand over something in exchange for money  <b>Change</b> - the difference in money, returned to the buyer, between what is paid for something and the lesser amount that it costs</p> <p><b>Multiplication and Division:</b>  <b>Repeated addition</b>-addition of the same number e.g. 3 + 3 + 3  <b>Multiplier</b>- The number that you are multiplying by  <b>Multiplicand</b>-The number that gets multiplied  <b>Product</b>- The answer when two or more values are multiplied together.  <b>Row</b>- Numbers can go across/along a row in a straight line  <b>Column</b>- Numbers can go up or down a column in a vertical arrangement</p>	<p><b>Geometry: Shape</b></p> <ul style="list-style-type: none"> <li>Count faces/edges/vertices on 3-D shapes and use to sort 3-D shapes</li> <li>Make patterns with 2-d and 3-D shapes</li> <li>compare and sort common 2-D shapes/3d shapes and everyday objects recognise <b>Assessment – Exit – Shape</b></li> </ul> <p><b>Addition and Subtraction:</b> Applying knowledge</p> <p><b>Measurement: Money</b> - Children will recognise and know the value of different denominations of coins and notes and use their knowledge of place value to match coins with equivalent values. Introduce the £ and p symbols for the first time. Children will then count in 1 p, 2 p, 5 p and 10 p coins. Then count in pounds. Children must be aware that both coins and notes are used to represent amounts in pounds. Children will then count pounds and pence together. Children compare two different values in either pounds or pence and will build on their knowledge of addition to add money as well as find the difference. Children build on their subtraction skills by finding change from a given amount. <b>Assessment – WRH Money - End Block</b></p> <p><b>Multiplication</b> - Recognise, make (sharing/grouping) and add equal groups. What is an array? Look for arrays in classroom and in real life context. Make arrays as a class.</p> <ul style="list-style-type: none"> <li>using and understanding arrays</li> <li>Understand and recognise the multiplication symbol .</li> <li>Making doubles/2/5/10 times tables/Making Equal Groups – Sharing and Grouping <b>Assessment – Multiplication and Division</b></li> </ul>



YEAR 3

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# YEAR 3 Overview

## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>			Number <b>Addition and subtraction</b>				Number <b>Multiplication and division A</b>				
Spring	Number <b>Multiplication and division B</b>			Measurement <b>Length and perimeter</b>			Number <b>Fractions A</b>		Measurement <b>Mass and capacity</b>			
Summer	Number <b>Fractions B</b>		Measurement <b>Money</b>		Measurement <b>Time</b>		Geometry <b>Shape</b>		Statistics		Consolidation	



# Year 3 – Aut 1 Maths – Place Value

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<ul style="list-style-type: none"> <li>count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.</li> <li>recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)</li> <li>compare and order numbers up to 1,000</li> <li>identify, represent and estimate numbers using different representations</li> <li>read and write numbers up to 1,000 in numerals and in words</li> <li>solve number problems and practical problems involving these ideas.</li> </ul>	<p>Manageable, sequenced small steps</p> <p>Mastery approach to embed understanding</p> <p>Rapid recall of key facts</p> <p>Repetition</p> <p>CPA Approach</p> <p>Key vocabulary use</p>	<p>3NPV-1 - Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10</p> <p>3NPV-2 - Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.</p> <p>3NPV-3 - Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.</p> <p>3NPV-4 - Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.</p>	<p>numeral</p> <p>count in ones, twos, fives, tens, threes, fours, eights, fifties and so on to hundreds</p> <p>pattern</p> <p>ones</p> <p>tens, hundreds</p> <p>digit</p> <p>one-, two- or three-digit</p> <p>number</p> <p>place, place value</p> <p>one more, ten more, one hundred more</p> <p>one less, ten less, one hundred less</p>	<p>Children will represent numbers to 100 using a range of concrete materials, such as counters and Base 10 equipment etc. Children use a part-whole model to explore how tens and ones can be partitioned and recombined to make a total. Children explore numbers to 1000 and show them with concrete and pictorial representations.</p> <p>Children understand that a 3-digit number is made up of 100s, 10s and 1s. They read numbers shown in different representations on a place value grid, and write them in numerals. Children use place value counters to represent different numbers and understand how a number is made. Children estimate, work out and write numbers on a number line.</p> <p>Building on children's learning in Year 2 they explore finding one more/less, children now move onto finding 10 and 100 more or less than a given number. Children recap finding one more or less by making the number concretely before pictorials and numerals.</p> <p>Children use objects to represent numbers to 1,000. When given two numbers represented by objects, they use comparative language and symbols to determine which is greatest/smallest. Children make the numbers using concrete manipulatives and draw them pictorially. Children compare numbers presented as numerals rather than objects. Children explore ordering a set of numbers from smallest to greatest and greatest to smallest. Children use Base 10 or other concrete materials to help them to make decisions about ordering.</p> <p>Children use their knowledge of the patterns in the 5 times table to count in steps of 50. Children identify the pattern.</p>

# Year 3- Aut 1 Maths – Addition and subtraction

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<ul style="list-style-type: none"> <li>Add and subtract numbers using concrete objects, pictorial representations and mentally.</li> <li>Add and subtract numbers with up to 3 digits, using formal written method of column addition and subtraction.</li> </ul>	<p>Manageable, sequenced small steps</p> <p>Mastery approach to embed understanding</p> <p>Rapid recall of key facts</p> <p>Repetition</p> <p>CPA Approach</p> <p>Key vocabulary use</p>	<p>3NF-1 - Secure fluency in addition and subtraction facts that bridge 10, through continued practice.</p> <p>3AS-1 - Calculate complements to 100.</p> <p>3AS2 - Add and subtract up to three-digit numbers using columnar methods.</p> <p>3AS-3 - Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.</p>	<p>Addition</p> <p>Total</p> <p>Altogether</p> <p>Sum</p> <p>how many more to make ...?</p> <p>How many more is ... than ...?</p> <p>how much more is ...?</p> <p>subtract</p> <p>take away how many are left/left over?</p> <p>difference</p> <p>between</p> <p>equals bonds/pairs/facts missing</p> <p>number tens</p> <p>boundary,</p> <p>hundreds</p> <p>boundary</p>	<p>Children are introduced to adding numbers greater than 100. They will apply their prior knowledge of adding and subtracting ones and tens to adding and subtracting multiples of 100. Using concrete manipulatives and pictorial representations throughout is important so the children can see the value of the digits.</p> <p>Children should start seeing the pattern when we add and subtract 1 and comment upon what happens. This is the step before finding ten more than or ten less than, as bridging beyond a 10 should not be attempted yet. The pattern should be highlighted also by adding 2 (by adding another one) and then adding 3.</p> <p>Children add and subtract ones from a 3-digit number without an exchange. They consider which digits are affected when adding ones. For example, if a child is completing <math>214 - 3</math> and <math>214 + 3</math> they see that they just need to focus on the ones column. Therefore, all they need to do is <math>4 + 3</math> and <math>4 - 3</math> respectively. The use of the column method can be used but mental arithmetic is the best strategy.</p> <p>Children add ones to a 3-digit number, with an exchange. They discover that when adding ones it can affect the ones column and the tens column.</p> <p>Children subtract a 1-digit number from a 3-digit number using an exchange.</p>

# Year 3 Aut 2 Maths – Addition and subtraction

NC PoS	KEY CONCEPTS	KEY COMPETENCIES	KEY VOCABULARY	KEY ACTIVITIES
<ul style="list-style-type: none"> <li>Add and subtract numbers using concrete objects, pictorial representations and mentally.</li> <li>Add and subtract numbers with up to 3 digits, using formal written method of column addition and subtraction.</li> </ul>	<p>Manageable, sequenced small steps</p> <p>Mastery approach to embed understanding</p> <p>Rapid recall of key facts</p> <p>Repetition</p> <p>CPA Approach</p> <p>Key vocabulary use</p>	<p>3AS2 - Add and subtract up to three-digit numbers using columnar methods.</p> <p>Add and subtract 100s</p> <ul style="list-style-type: none"> <li>Spot the pattern - making it explicit</li> <li>Mixed addition and subtraction problems</li> <li>Add and subtract 2-digit &amp; 3-digit numbers- not crossing 10 or 100</li> <li>Add 2-digit and 3-digit numbers - crossing 10 or 100</li> <li>Subtract a 2-digit number from a 3-digit number - crossing 10 or 100</li> <li>Add two 3-digit numbers - not crossing 10 or 100</li> <li>Add two 3-digit numbers - crossing 10 or 100</li> <li>Subtract a 3-digit number from a 3-digit number - no exchange</li> <li>Subtract a 3-digit number from a 3-digit number - exchange</li> </ul>	<p>Addition</p> <p>Total</p> <p>Altogether</p> <p>Sum</p> <p>how many more to make ...?</p> <p>How many more is ... than ...?</p> <p>how much more is ...? subtract</p> <p>take away how many are left/left over?</p> <p>difference between equals bonds/pairs/facts missing number tens boundary, hundreds boundary</p>	<p><b>3AS2</b></p> <p>Children are introduced to adding numbers greater than 100 They will apply their prior knowledge of adding and subtracting ones and tens to adding and subtracting multiples of 100 Using concrete manipulatives and pictorial representations throughout is important so the children can see the value of the digits.</p> <p>Children should start seeing the pattern when we add and subtract 1 and comment upon what happens. This is the step before finding ten more than or ten less than, as bridging beyond a 10 should not be attempted yet. The pattern should be highlighted also by adding 2 (by adding another one) and then adding 3</p> <p>Children add and subtract ones from a 3-digit number without an exchange. They consider which digits are affected when adding ones. For example, if a child is completing <math>214 - 3</math> and <math>214 + 3</math> they see that they just need to focus on the ones column. Therefore, all they need to do is <math>4 + 3</math> and <math>4 - 3</math> respectively. The use of the column method can be used but mental arithmetic is the best strategy.</p> <p>Children add ones to a 3-digit number, with an exchange. They discover that when adding ones it can affect the ones column and the tens column.</p> <p>Children subtract a 1-digit number from a 3-digit number using an exchange.</p>

# Year 3- Aut 2 Maths – Multiplication and Division

NC PoS	KEY CONCEPTS	KEY COMPETENCIES	KEY VOCABULARY	KEY ACTIVITIES
<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for the 3,4, and 8 multiplication tables.</li> <li>Write and calculate mathematical statements for multiplication and division using the tables they know including for 2 digit numbers times 1 digit numbers using mental and progressing to formal methods.</li> </ul>	<p>Pathway 3 Multiplication and Division</p> <p>Manageable, sequenced small steps</p> <p>Mastery approach to embed understanding</p> <p>Rapid recall of key facts</p> <p>Fluency</p> <p>Repetition</p> <p>Repetition and structure</p> <p>Key vocabulary use</p>	<p>2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product.</p> <p>2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division).</p> <p>3NF-2 Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number</p>	<p>multiple, factor lots of, groups of product repeated addition</p> <p>division grouping equal groups array</p> <p>multiplication fact division fact fact families</p>	<p><b>3MD-1 – Multiplication and division structure</b>  <b>2MD-1 – Multiplication as repeated addition</b>  <b>2MD-2 – Grouping problems: missing factors and division</b></p> <p>Pupils recap their understanding of recognising, making and adding equal groups: preparing them for the next steps. Pupils explore the commutativity of multiplication facts e.g. <math>5 \times 2 = 2 \times 5</math>. The language 'lots of' is used.</p> <p>Pupils draw on their knowledge of counting in 3s in order to start to multiply by 3. Pupils use their knowledge of equal groups to use concrete and pictorial methods to solve questions multiplying by 3. Pupils explore dividing by sharing into three equal groups and then grouping in threes. They use bar models to support this along with arrays. Pupils use this knowledge and draw on it to become fluent in the 3 times table.</p> <p>Building on knowledge of the 2 times table, pupils multiply by 4. They link multiplying by 4 to doubling and then doubling again. They use a variety of methods both practical and pictorial. Pupils explore dividing by sharing into four equal groups and then grouping in fours. Pupils use their knowledge of 2,5,10,3 times tables to learn the 4s. They explore the commutativity of multiplication.</p> <p>Building on knowledge of the 4 times table, pupils multiply by 8. Pupils understand that each multiple of 8 is double the equivalent multiple of 4. Pupils explore divide by sharing and grouping. Pupils explore the fact families of the 8 times tables.</p> <p>Pupils complete reasoning and problem solving lessons combining this learning. Focused on explanations using the correct terminology.</p>

# Year 3- Spr 1 Maths - Multiplication and Division

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
<ul style="list-style-type: none"> <li>Recall and use multiplication and division facts for the 3,4, and 8 multiplication tables.</li> <li>Write and calculate mathematical statements for multiplication and division using the tables they know including for 2 digit numbers times 1 digit numbers using mental and progressing to formal methods.</li> </ul>	<p>Manageable, sequenced small steps</p> <p>Mastery approach to embed understanding</p> <p>Rapid recall of key facts</p> <p>Fluency</p> <p>Repetition</p> <p>Repetition and structure</p> <p>Key vocabulary use</p>	<p>3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.</p> <p>3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).</p> <p>3MD-1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.</p>	<p>multiple, factor lots of, groups of product repeated addition</p> <p>division grouping equal groups array</p> <p>multiplication fact division fact fact families</p>	<p><b>3MD-1 – Multiplication and division structure</b>  <b>3NF-2 – Recall of multiplication tables</b>  <b>3NF-3 – Scaling number facts by 10</b></p> <p>Pupils will recap the concept of multiplication so they can apply this to multiplication tables. Images, as well as number tracks, will be used to encourage children to count in twos. Resources such as cubes and number pieces will be used to explore equal groups within the 2 times-table. Children use knowledge of known multiplication tables (2, 3, 5 and 10 times tables) and understanding of key concepts of multiplication to develop knowledge of the 4 and 8 times table. Notes and Guidance Mathematical Talk Varied Fluency Children use their knowledge of multiplication and division facts to compare statements using inequality symbols.</p> <p>Pupils use known multiplication facts to solve other multiplication problems. Pupils understand that because one of the numbers in the calculation is ten times bigger, then the answer will also be ten times bigger.</p> <p>Children use their understanding of repeated addition to represent a two-digit number multiplied by a one-digit number with concrete manipulatives. They use the formal method of column multiplication alongside the concrete representation. Pupils explore firstly with no exchange and then with exchange. . Each question in this step builds in difficulty.</p> <p>Children divide 2-digit numbers by a 1-digit number by partitioning into tens and ones and sharing into equal groups. Beginning with no exchange, exchange and then remainders, Links are made between division and repeated subtraction, which builds on learning in Year 2.</p> <p>Pupils explore scaling problems using bar models.</p>

# Year 3- Spr 1 Maths – Length & Perimeter

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
<ul style="list-style-type: none"> <li>• Interpret and present data using bar charts, pictograms and tables.</li> <li>• Solve one step and two step questions e.g. How many more?, How many fewer? Using information presented in scaled bar charts, pictograms and tables</li> </ul>	<p>Manageable, sequenced small steps</p> <p>Mastery approach to embed understanding</p> <p>Rapid recall of key facts</p> <p>Fluency</p> <p>Repetition</p> <p>Repetition and structure</p> <p>Key vocabulary use</p>	<p>3NPV3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10</p> <p>3NF3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).</p>	<p>Metres</p> <p>Centimetres</p> <p>Millimetres</p> <p>Equivalent</p> <p>Lengths</p> <p>Perimeter</p> <p>Greater than</p> <p>Less than</p> <p>Equal to</p>	<p>In Year 2, children used metres or centimetres to measure the length of objects. In this small step, they revise these skills, initially using a ruler to measure objects in centimetres. They then combine both units of measurement, such as 1 m and 20 cm (measuring the lengths of desks/heights of children in the class).</p> <p>Children need to understand that 1 mm is smaller than 1 cm and that millimetres can be used to measure lengths that are not an exact number of centimetres. Children explore a ruler with millimetre markings to see that there are 10 mm in 1 cm. Children are encouraged to count in 10s and add on the remaining 1s when finding lengths.</p> <p>Children piggyback learning from the previous steps to measure objects in centimetres and millimetres. Measurements should be recorded in the form “4 cm and 3 mm”. Children compare and consider the appropriateness of different units of measurement. Which unit would you use to measure this? Why?</p> <p>Children use the fact that 1 m is equivalent to 100 cm. They use this to convert multiples of 100 cm into metres and metres into multiples of 100 cm. Children use the fact that 1 cm is equivalent to 10 mm. They use this to convert millimetres into centimetres and centimetres into millimetres.</p> <p>Children compare and order lengths using comparison language and inequality symbols. They convert measurements to the same unit of length to compare.</p> <p>Children add lengths. They begin with lengths measured in the same unit, before adding lengths that have different unit. Children begin by subtracting lengths that are measured in the same unit of measurement. They then look at subtracting millimetres from a whole number of centimetres as well as centimetres from a whole number of metres using simple conversions.</p> <p>Children are introduced to perimeter. Children learn that perimeter is the distance around the outside of a closed 2-D shape. Children measure the sides of different shapes in centimetres to find perimeter. Children use their understanding of the properties of different shapes to calculate the perimeter of simple 2-D shapes.</p>



YEAR 4

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# YEAR 4 Overview

## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value				Number Addition and subtraction			Measurement Area	Number Multiplication and division A			Consolidation
Spring	Number Multiplication and division B			Measurement Length and perimeter		Number Fractions			Number Decimals A			
Summer	Number Decimals B		Measurement Money		Measurement Time		Consolidation	Geometry Shape		Statistics	Geometry Position and direction	

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Pupils should be taught to: count in multiples of 6, 7, 9, 25 and 1000, find 1000 more or less than a given number, count backwards through zero to include negative numbers, recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones), order and compare numbers beyond 1000, identify, represent and estimate numbers using different representations, 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</p>	<p><b>Curriculum concepts:</b> Coherence Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children</p> <p>Fluency Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics</p> <p>Interleaved learning will support children in their ability to successfully commit previous learning into their long term memory. Therefore the curriculum will have regular repetition</p>	<p><u>Pathway 1: Number- Place Value</u></p> <p><b>4NPV-1</b> <b>4NPV-2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.</b> <b>4NPV-3</b> <b>3NPV-4 divide 100 into 2, 4 and 10 equal parts.</b></p> <ol style="list-style-type: none"> <li>LO: I can read and represent numbers to 1000.</li> <li>LO: I can read and represent numbers containing thousands.</li> <li>LO: I can <b>identify</b> the value of digits in 4 digit numbers.</li> <li>LO: I can <b>partition</b> 4 digit numbers.</li> <li>LO: I can <b>partition</b> numbers in different ways up to 10,000.</li> <li>LO: I can <b>identify</b> amounts up to 10,000 on a number line.</li> <li>LO: I can <b>estimate</b> and identify numbers up to 10000 using a number line.</li> <li>LO: I can <b>compare</b> 4 digit numbers.</li> <li>LO: I can <b>order</b> 4 digit</li> </ol>	<p>Value Represent Digit Partition Estimate Ascending Descending Rounding Number line Roman Numeral Greater than Less than Integer Compare</p>	<ol style="list-style-type: none"> <li>Children learned how to represent numbers to 1,000 in Year 3 – a concept that will be reinforced in this small step to ensure they have a sound understanding. Examples have been chosen to ensure that children look at representing and interpreting numbers that have no tens or no ones, to reinforce the idea of using zero as a placeholder. <a href="#">Extend- What comes after 1000 how is this number made?</a></li> <li>The initial focus of this small step is counting in 1,000s forwards and backwards from any given multiple of 1,000. Children then look at the composition of multiples of 1,000 by exploring how many hundreds they are made of. They unitise the hundred, being able to state the number of hundreds that make up any 4-digit multiple of 100 or 1,000 such as “20 hundreds are equal to 2,000” <a href="#">Broaden- Where may thousands be used/ seen in every day life? Is it a big quantity?</a></li> <li>Children represent numbers to 9,999, using concrete resources on a place value grid. They understand that a four digit number is made up of 1,000s, 100s, 10s and 1s. Moving on from Base 10 blocks, children start to partition by using place value counters and digits. <a href="#">Extend- What is the next column on a place value grid? What number comes after 9999?</a></li> <li>The focus of this small step is to ensure that children have a secure understanding of place value with 4-digit numbers. Children partition a number up to 10,000 by identifying the number of thousands, hundreds, tens and ones. They should give their answers using numerals, words and expanded form, for example <math>5,346 = 5 \text{ thousands}, 3 \text{ hundreds}, 4 \text{ tens and } 6 \text{ ones}</math> or <math>5,000 + 300 + 40 + 6</math>. Children should experience questions that include zero as a placeholder, so they understand this cannot be omitted, minimising the misconception that <math>5,006 = 56</math> <a href="#">Challenge- Is there only 1 way a number can be partitioned?</a></li> <li>Children explore flexible partitioning of numbers up to 10,000, understanding that the whole number can be split into parts in many different ways. . A key focus should be appreciating that, for example, <math>6,000 + 400 + 20 + 9 = 5,000 + 1,400 + 20 + 9</math>, as this is crucial to understanding addition and subtraction of 4-digit numbers <a href="#">Broaden- Why is it important to partition in different ways?</a></li> </ol>

Year 4- Aut 1 Maths – Addition and Subtraction Weeks 6-8				
NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Pupils should be taught to: count in multiples of 6, 7, 9, 25 and 1000, find 1000 more or less than a given number, count backwards through zero to include negative numbers, recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones), order and compare numbers beyond 1000, identify, represent and estimate numbers using different representations, 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</p>	<p><b>Curriculum Concepts:</b></p> <p>Coherence Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children</p> <p>Fluency Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics</p> <p>Interleaved learning will support children in their ability to successfully commit previous learning into their long term memory. Therefore the curriculum will have regular repetition</p>	<p><u>Pathway 2: Number- Addition and Subtraction</u></p> <p><b>4NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)</b></p> <p><b>3AS-3 missing number problems</b></p> <p>1. LO: I can <b>add and subtract</b> 1s, 10s, 100s and 1,000s</p> <p>2. LO: I can <b>add</b> up to two 4-digit numbers (no exchange)</p> <p>3. LO: I <b>can add</b> two 4-digit numbers (including one exchange)</p> <p>4.LO: I <b>can add</b> two 4-digit numbers (more than one exchange)</p> <p>5. LO: I can <b>subtract</b> two 4-digit numbers (no exchange).</p> <p>6. LO: I can <b>subtract</b> two 4-digit numbers (one exchange)</p> <p>7. LO: I can <b>subtract</b> two 4-digit numbers (more than one exchange).</p> <p>8. LO: I can <b>solve</b> efficient subtraction calculations.</p> <p>9. LO: I can <b>estimate</b> answers to calculations.</p> <p>10. LO: I can <b>estimate</b> the difference between two numbers</p>	<p>Digit</p> <p>Partition</p> <p>Sum</p> <p>Increase</p> <p>Addend</p> <p>Augend</p> <p>Minus</p> <p>Difference</p> <p>Subtrahend</p> <p>Minuend</p> <p>Decrease</p> <p>Exchange</p> <p>Inverse</p> <p>Efficient</p> <p>Method</p> <p>Estimate</p> <p>Approximate</p>	<p>1. In this small step, children recap this learning and extend their understanding to dealing with 4-digit numbers and adding and subtracting multiples of 1,000. The focus is on mental rather than written strategies. <b>Challenge-</b> When adding to one column does this affect any others?</p> <p>2. Children add 3- or 4-digit numbers with no exchanges, using concrete resources as well as the formal written method. The numbers being added together may have a different number of digits, so children need to take care to line up the digits correctly. Even though there will be no exchanging, the children should be encouraged to begin adding from the ones column. <b>Broaden-</b> When may adults use this method?</p> <p>3. The numbers can be made using concrete manipulatives such as place value counters in a place value chart, alongside the formal written method. Encourage to carry the one under the line and cross this out to avoid forgetting later on. <b>Challenge-</b> What is exchange?</p> <p>4. The numbers are made using place value counters in a place value chart alongside the formal written method. The addition begins from the smallest value column. With more than one exchange, it is important to model the correct place to write the number exchanged and to add it to the next column. <b>Extend-</b> Can you spot an exchange before carrying out the calculation?</p> <p>5. Children subtract up to a 4-digit number from a 4-digit number with no exchanges, using concrete resources as well as the formal written method. Ensure numbers are set out neatly to avoid mistakes when crossing out. <b>Challenge-</b> Explain how an exchange is made and why.</p> <p>6. It is important that children complete the formal written method alongside any concrete manipulatives to support understanding. Before subtracting each column, ask, “Do you have enough ones/tens/hundreds to subtract ?” If not, then an exchange is needed. For this small step, the exchange could take place from the tens, hundreds or thousands, but there is only one exchange per calculation. <b>Extend-</b> Can you spot an exchange before carrying out the calculation? How?</p> <p>7. Children perform subtractions involving two separate exchanges (for example, from the thousands and from the tens) as well as those with two-part exchanges (for example, from the thousands down to the tens if there are no hundreds in the first number). To support understanding, continue solving</p>



# Year 4- Spr 1 Maths – Number: Weeks 1-3 Multiplication and Division

NC PoS	Key Concepts	Key competencies	Key Vocabulary	Key Activity
<p>Pupils should be taught to:</p> <p>recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math> ☐ use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. multiply 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</p>	<p><b>Coherence</b> Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children</p> <p><b>Fluency</b> Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics</p> <p><b>Interleaved learning will support children in their ability to successfully commit previous learning into their long term memory. Therefore the curriculum will have regular repetition.</b></p>	<p><b>Pathway 3: Number-Multiplication and Division</b></p> <p><u>Multiplication:</u></p> <p>1.LO: I can find factor pairs of given numbers.  2.LO: I can work out multiplication problems by using different methods.  3. I can work out multiplication problems by choosing the most efficient method.  4. LO: I can multiply a 1 digit number by a 2 digit number.  5. LO: I can multiply a 1 digit number by a 2 digit number using the column method.  6. LO: I can multiply 3 digit numbers by 1 digit number using the column method.  7. LO: I can answer reasoning problems using column multiplication.</p> <p><u>Division:</u></p> <p>8 and 9. LO: I can divide 2 digit numbers by a 1 digit number.  10. LO: I can divide 2 digit numbers by a 1 digit number including remainders.  11. LO: I can divide 3 digit numbers by a 1 digit number</p>	<p>Multiplicand  Multiplier  Product  Lots of  Dividend  Divisor  Quotient  Difference  Sum  Share  Group  Factor  Repeated addition  Part-part-whole  Array  Inverse  Possibilities  Correspondence  Outcome</p>	<p>1. In this small step, children are introduced to factors for the first time. They learn that when they multiply two whole numbers to give a product, both the numbers that they multiplied together are factors of the product. For example, <math>3 \times 5 = 15</math>, so 3 and 5 are factors of 15. 3 and 5 are also referred to as a “factor pair” of 15 They then generalise this further to conclude that a factor of a number is a whole number that divides into it exactly. Children create arrays using counters to develop their understanding of factor pairs. It is important for children to work systematically when finding the factor pairs of a number in order to ensure that they find all the factors. For example, when finding factor pairs of 12, begin with <math>1 \times 12</math>, then <math>2 \times 6</math>, <math>3 \times 4</math>. At this stage, children should recognise that they have already used 4 in the previous calculation, therefore all factor pairs have been identified. <b>Extend – the bigger the number, the more factors it will have. True or false?</b></p> <p>2. In this small step, children build on their knowledge of factor pairs from the previous step as they use them to write equivalent calculations. For example, as 3 and 4 are a factor pair of 12, this means that <math>5 \times 12</math> is equivalent to <math>5 \times 3 \times 4</math> or <math>5 \times 4 \times 3</math> Children explore equivalent calculations using different factors pairs, and then practise calculating with them to identify which factor pair produces the easiest calculation to complete mentally. The calculation that is deemed easiest will vary for different children, as they are likely to focus on using the times-tables they are most confident with. Children also look at the method of partitioning to find the answers to multiplication problems and try to choose an efficient method for the calculation given. <b>Challenge – column multiplication is the quickest method.</b></p> <p>3. In this small step, children consolidate their knowledge and understanding of multiplication and begin to make decisions regarding the most efficient or appropriate methods to use in a range of contexts. Children look at times-tables facts, building strategies for finding unknown facts that will support them to strengthen their fluency of times-tables. They then examine a range of strategies for multiplying a 2-digit number by a 1-digit number. Finally, they use arrays to explore multiplicative structure, in particular the associative law and distributive law. <b>Challenge – in multiplication I have to start with the largest number.</b></p> <p>4. Children look at partitioning the number. They begin by using place value charts to recognise multiples of a number and make the link to repeated addition. The use of base 10 encourages children to partition the tens and ones</p>

## Year 4-Aut 2 Maths – Measurement (Area):1 week

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Pupils should be taught to: Convert between different units of measure [for example, kilometre to metre; hour to minute] measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p>	<p><b>Equipping children with a broad range of vital skills which can be applied not only within school but used in everyday life.</b></p> <p><b>Representation and Structure</b></p> <p><b>Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation</b></p>	<p><b>Pathway 5 – Measurement.</b></p> <p><u>Area</u></p> <p>1. LO: I understand what area is and I can begin to calculate the area of shapes.</p> <p>2. LO: I can calculate area by counting squares.</p> <p>3. LO: I can expand the area of a shape.</p> <p>4. LO: I can compare the area of rectilinear shapes.</p>	<p>Area</p> <p>Product</p> <p>Cm squared</p> <p>Length</p> <p>Width</p>	<p>1. Children are introduced to area for the first time. They understand that area is the amount space is taken up by a 2D shape or surface. Children investigate different shapes that can be made with sets of sticky notes. They should be encouraged to see that the same number of sticky notes can make different shapes but they cover the same amount of surface. We call this the area of a shape.</p> <p><b>Broaden- When might you need to work out the area of shapes in real life?</b></p> <p>2. Once children understand that area is measured in squares, they use the strategy of counting the number of squares in a shape to measure and compare the areas of rectilinear shapes. They explore the most efficient method of counting squares and link this to their understanding of squares and rectangles.</p> <p><b>Extend- Is there a quicker way to calculate the area of a shape rather than counting all the squares?</b></p> <p>3. Children learn that a rectilinear shape is a shape that has only straight sides and right angles. They explore the idea that rectilinear shapes need to touch at the sides and not just at the corners. Children may notice that a rectilinear shape looks like two rectangles joined together, but should be careful not to calculate the area as two rectangles added together, as this will sometimes include an overlap. Children should work systematically to find all the different rectilinear shapes using a given number of squares by moving one square at a time, before moving on to drawing their own shapes with a given area.</p> <p><b>Challenge- Can a quadrilateral shape have an odd area? Why?</b></p> <p>4. Children compare the area of rectilinear shapes where the same size square has been used. Children will be able to use &lt; and &gt; with the value of the area to compare shapes. They will also be able to use = to compare shapes with the same area.</p>



# Year 4-Aut 2 Maths – Multiplication and Division: 6 weeks

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Pupils should be taught to: recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math>, 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, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p>	<p><b>Adopting the mastery approach, teachers will spend longer on topics in order to embed understanding and develop rich connections across topics</b></p> <p><b>Fluency</b>  <b>Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics</b></p> <p><b>The ability to calculate both mentally and in written form lies at the heart of Mathematics and continued revisiting and consolidation of these skills is essential In order to commit them to long term memory, including the ability to rapidly recall key facts</b></p>	<p><b>Pathway 3- Number</b></p> <p><u>Multiplication and division</u></p> <ol style="list-style-type: none"> <li>LO: I can apply place value knowledge to known additive and multiplicative number facts.</li> <li>LO: I can multiply by 10</li> <li>LO: I can multiply by 100.</li> <li>LO: I can divide by 10.</li> <li>LO: I can divide by 100</li> <li>LO: I can multiply by 1 and 0</li> <li>LO: I can divide by 1 and itself</li> <li>LO: I can multiply by 4 (Teacher to choose times table to work on)</li> <li>LO: I can understand the relationship between the 3 and 6 times table.</li> <li>LO: I can multiply and divide by 6</li> <li>LO: I can solve problems involving the 6 x table.</li> <li>LO: I can multiply and divide by 9</li> <li>LO: I can solve problems involving the 9 times table.</li> <li>LO: I can multiply and divide by 7</li> <li>LO: I can solve problems involving the 7 times table</li> <li>LO: I can solve problems involving the 11 x table.</li> <li>LO: I can solve problems involving the 12 x table.</li> <li>LO: I can multiply 3 numbers</li> <li>LO: I can recall multiplication and division facts up to <math>12 \times 12</math></li> </ol>	<p>multiplication  multiply  multiple  factor  groups of  times  product  repeated addition  division  grouping  sharing  equal parts  multiplier  multiplicand  divisor  dividend  quotient  array  inverse  efficient</p>	<ol style="list-style-type: none"> <li>Children to revisit basic addition facts they know such as <math>6 + 6 = 12</math> and relate this to 6 hundreds + 6 hundreds = 12 hundreds. Show children representations such as part whole models, place value counters on a grid and bar models so they can visualise this. Move onto multiplication facts and how we can use the technique of scaling to help us work out problems involving multiplying big numbers together. For example we know <math>2 \times 3 = 6</math> so <math>2 \times 30 = 60</math>  <b>Challenge- Can you use this knowledge to alter a recipe for a set amount of people?</b></li> <li>Children need to be able to visualise and understand making a number ten times bigger and that ‘ten times bigger’ is the same as ‘multiply by 10’ The language of ‘ten lots of’ is vital to use in this step. The understanding of the commutative law is essential because children need to see calculations such as <math>10 \times 3</math> and <math>3 \times 10</math> as equal.  <b>Broaden- Is multiplying by 10 the same as adding a zero?</b></li> <li>Children build on multiplying by 10 and see links between multiplying by 10 and multiplying by 100 Use place value counters and Base 10 to explore what is happening to the value of the digits in the calculation and encourage children to see a rule so they can begin to move away from concrete representations.  <b>Challenge- Is multiplying by 10 twice the same as multiplying by a hundred?</b></li> <li>Exploring questions with whole number answers only, children divide by 10 They should use concrete manipulatives and place value charts to see the link between dividing by 10 and the position of the digits before and after the calculation. Using concrete resources, children should begin to understand the relationship between multiplying and dividing by 10 as the inverse of the other.  <b>Broaden- Can you just take off the zero when dividing by 10? Why?</b></li> <li>Children divide by 100 with whole number answers. Money and measure is a good real-life context for this, as coins can be used for the concrete stage.  <b>Extend- Can you use dividing by 10 to help you work out how to divide by 100?</b></li> <li>Children explore the result of multiplying by 1, using concrete equipment. Linked to this, they look at multiplying by 0 and use concrete equipment and pictorial representations of multiplying by 0  <b>Broaden- What do you notice about the factor pairs and the answers you get?</b></li> <li>Children learn what happens to a number when you divide it by 1 or by itself. Using concrete and pictorial representations, children demonstrate how both the sharing and grouping structures of division can be used to divide a number by 1 or itself. Use stem sentence to encourage children to see this e.g. 5 grouped into 5s equals 1 (<math>5 \div 5 = 1</math>) 5 grouped into 1s equals 5 (<math>5 \div 1 = 5</math>)  <b>Challenge- is dividing by 1 the same as dividing by itself?</b></li> <li>Teachers choose which times table children are struggling with (use baseline assessments on TTRS and weekly times table check to influence this.) Recap the sequences of this times table and start to problem solve with these learnt facts.  <b>Broaden- What do you notice about the factor pairs and the answers you get?</b></li> </ol>

# Year 4- Spr 1 Maths – Measurement and Number:

## Week 4-5 Length and Perimeter

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activity
<p>Pupils should be taught to:</p> <p>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. solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole</p>	<p><b>Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation.</b></p> <p><b>Adopting the mastery approach, teachers will spend longer on topics in order to embed understanding and develop rich connections across topics</b></p> <p><b>Gaps in learning will be identified and addressed quickly when they prevent a pupil from tackling more complex mathematical concepts</b></p>	<p><b>Pathway 5: Measurement- Length</b></p> <p><b>Pathway 4: Number - Fractions</b></p> <p><u>Perimeter:</u></p> <p>13. LO: I can convert between metres and kilometres.</p> <p>14. I can calculate perimeter by counting squares.</p> <p>15. I can calculate the perimeter of rectilinear shapes.</p> <p>16 and 17. I can calculate the perimeter of rectilinear shapes with missing lengths.</p> <p>18. LO: I can calculate the perimeter of regular polygons.</p> <p>19. LO: I can calculate the perimeter of irregular polygons.</p>	<p>Metres</p> <p>Kilometres</p> <p>Unit of length</p> <p>Length</p> <p>Width</p> <p>Perimeter</p> <p>Regular polygon</p> <p>Irregular polygon</p>	<p>13. In previous years, children measured lengths using metres (m) and centimetres (cm). In this small step, children are introduced to kilometres and the abbreviation "km". Children should understand that kilometres are greater than metres and are used to measure greater distances. The focus of this step is to partition measurements into the number of kilometres and metres and make links with addition. Bar models and part-whole models can be used to explore this relationship and to support children with their understanding. The fact that 1 km = 1,000 m can be discussed, but conversions are not explicitly covered until the next step. It is useful to make connections with real-life contexts, so that children are aware when different types of units are used.</p> <p><a href="#">Challenge – are km larger than m?</a></p> <p>14. In Year 3, children were introduced to the idea of perimeter by measuring and calculating the perimeter with labelled side lengths. In this small step, children explore perimeter further with a focus on rectilinear shapes, where all sides meet at right angles. These rectilinear shapes will be drawn on squared grids, mainly centimetre squared grids. Encourage children to label the lengths of the sides if needed, and to mark off each side as they add the lengths together. Looking at a variety of shapes enables children to compare their perimeters. They also explore drawing different shapes with a specified perimeter. They continue to consider rectilinear shapes only and do not look at diagonal lengths. <a href="#">Extend – what happens when we have half squares?</a></p> <p>15. This small step continues to build children's understanding of perimeter by exploring more rectilinear shapes, both with and without grids. Children know that a rectilinear shape has straight lines that meet at right angles. In this step, it is useful for children to measure the perimeter practically before they find the perimeter of a shape on a grid or from a shape with all side lengths labelled. When calculating, children should mark the sides they have already counted to avoid duplication or omission. <a href="#">Broaden – how can I use my multiplication knowledge to calculate perimeter?</a></p> <p>16 and 17. In this small step, children continue to look at rectilinear shapes, focusing on finding missing side lengths. Children explore the relationship between the sides of a rectilinear shape, rather than finding the perimeter. They start by using addition to find the missing side lengths, then using subtraction and finally using both operations to find more than one missing side length. Part-whole models may be useful here. Children may find it helpful</p>

YEAR 5

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# YEAR 5 Overview

## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>			Number <b>Addition and subtraction</b>		Number <b>Multiplication and division A</b>			Number <b>Fractions A</b>			
Spring	Number <b>Multiplication and division B</b>			Number <b>Fractions B</b>		Number <b>Decimals and percentages</b>			Measurement <b>Perimeter and area</b>		Statistics	
Summer	Geometry <b>Shape</b>			Geometry <b>Position and direction</b>		Number <b>Decimals</b>			Number <b>Negative numbers</b>	Measurement <b>Converting units</b>		Measurement <b>Volume</b>

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
Number and place value	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</li> <li>• count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</li> <li>• interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</li> <li>• round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> <li>• solve number problems and practical problems that involve all of the above</li> <li>• read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> </ul>	<p><b>Year 4 diagnostic assessment- week 3.</b></p> <p><b>White Rose Hub Initial Assessment</b></p> <p><b>LO: to investigate Roman numerals to 1000</b></p> <p><b>LO: to investigate numbers to 10,000</b></p> <p><b>LO: to investigate numbers to 100,000</b></p> <p><b>LO: to investigate numbers to 1,000,000</b></p> <p><b>LO: to read and write numbers to 1,000,000</b></p> <p><b>LO: to count forwards and backwards using powers of ten</b></p> <p><b>LO: to find 10, 100 and 1000 more or less than a number</b></p> <p><b>LO: to find 10,000 and 100,000 more or less than a number</b></p> <p><b>LO: to partition numbers to 1,000,000</b></p> <p><b>LO: to solve problems involving number lines to 1,000,000</b></p> <p><b>LO: to compare and order numbers to 100,000</b></p> <p><b>LO: to compare and order numbers to 1,000,000</b></p> <p><b>LO: to round to the nearest 10, 100 or 1000</b></p> <p><b>LO: to round within 100,000</b></p> <p><b>LO: to round within 1,000,000</b></p> <p><b>White Rose Hub End of Block Assessment</b></p> <p><b><u>Arithmetic Focuses:</u></b></p> <p><b>Division of two-digit numbers by 10 or 100.</b></p> <p><b>Addition and subtraction of fractions with the same denominator.</b></p> <p><b>Understanding a formal written method for subtraction with</b></p>	<p><i>Consecutive</i></p> <p><i>Descending order</i></p> <p><i>Digit</i></p> <p><i>Difference</i></p> <p><i>Greater than</i></p> <p><i>Integer</i></p> <p><i>Less than</i></p> <p><i>Ordinal number</i></p> <p><i>Place value</i></p> <p><i>Roman numerals</i></p> <p><i>Rounding</i></p> <p><i>Squared</i></p> <p><i>Ones</i></p> <p><i>Tens</i></p> <p><i>Hundreds</i></p> <p><i>Thousands</i></p> <p><i>Ten thousands</i></p> <p><i>Hundred thousands</i></p> <p><i>Million</i></p> <p><i>Numeral</i></p> <p><i>Compare</i></p> <p><i>Partition</i></p> <p><i>Order</i></p> <p><i>Strategy</i></p> <p><i>Representation</i></p> <p><i>Power of 10</i></p> <p><i>Exchange</i></p> <p><i>Negative Numbers</i></p> <p><i>Estimate</i></p> <p><i>Approximate</i></p>	<p>Children to use manipulatives and pictorial representations to read and write numbers. Use counters to make numbers on a place value chart. Give children number cards with a selection of numbers up to 1,000,000 spread out on their table. Ask them to locate a particular number and read it. Ask children to write given numbers on whiteboards. Count on a 100 square in powers of 10 for a given number. Try without the number square. Provide opportunities for children to consider place value in different contexts, e.g. money. Use place value sliders to show numbers and read them before writing them. Identify negative numbers in real life. Count forwards and backwards through zero with physical number lines and ask children to count on or back a certain amount. Round numbers in real life, round to nearest 10 and 100 first, reinforcing the value of each digit in the number and which digits will change/stay the same. Teach children Roman numerals to 1000 and show them years written in Roman numerals. Look for patterns in the Roman numerals. Give children lollipop sticks and give them time to make the Roman numeral when a number is given.</p>



# Year 5 – Aut 1 Maths Context: Addition and subtraction

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
Addition and subtraction.	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>add and subtract whole numbers with more than 4 digits, including using formal</li> <li>written methods (columnar addition and subtraction)</li> <li>add and subtract numbers mentally with increasingly large numbers</li> <li>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</li> <li>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>	<p><b>WhiteRose Hub Initial Assessment</b></p> <p><b>LO: to use mental strategies for addition and subtraction</b></p> <p><b>LO: to add whole numbers with more than four digits using column addition</b></p> <p><b>LO: to subtract whole numbers with more than four digits using column subtraction</b></p> <p><b>LO: to use rounding to check answers to calculations and determine accuracy</b></p> <p><b>LO: to use inverse operations to check the answers to calculations</b></p> <p><b>LO: to solve addition and subtraction multistep problems</b></p> <p><b>LO: to compare calculations</b></p> <p><b>LO: to solve problems involving missing numbers</b></p> <p><b>White Rose Hub End of Block Assessment</b></p> <p><b><u>Arithmetic Focuses:</u></b></p> <p><b>Square Numbers</b></p> <p><b>Multiplication and division of whole numbers by 10, 100 and 1,000</b></p>	<p><i>Difference</i></p> <p><i>Inverse</i></p> <p><i>Operation</i></p> <p><i>Column addition</i></p> <p><i>Column subtraction</i></p> <p><i>Written methods</i></p> <p><i>Integer</i></p> <p><i>Rounding</i></p> <p><i>Sum</i></p> <p><i>Equals</i></p> <p><i>Place Holder</i></p> <p><i>Estimate</i></p> <p><i>Approximate</i></p> <p><i>Key Vocabulary</i></p> <p><i>Multistep</i></p> <p><i>Problems</i></p> <p><i>Efficient</i></p> <p><i>Exchange</i></p> <p><i>Sum</i></p>	<p>Give children real life scenarios when they might need to use addition and subtraction. Allow children to look at toy catalogues on the internet. They could choose pairs of toys to find the total price and difference using a mental calculation strategy. Children could use take-away menus to plan a meal. They could choose four options and find the total cost using a mental calculation strategy. They could work within a budget and, using the counting on strategy, find out how much of their budget is left. Give children missing number questions, if this is the answer then what is the problem questions, instructions to find a mystery number questions. Use bar model to answer problems. Use bar model to find missing numbers and to problem solve. Give children missing number questions, if this is the answer then what is the problem questions, instructions to find a mystery number questions. Give children part whole diagrams, missing number statements and word problems to choose a strategy to solve.</p>



# Year 5-Aut 1 Maths      Context: Multiplication and division

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
Multiplication and division	<p><b>Pathway 3</b></p> <p>5NF-1- Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.</p> <p>5MD- 1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.</p> <p>5MD- 2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.</p> <p>5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.</p> <p>5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.</p>	<p><b>Start and continue in Autumn 2</b></p> <p><b>White Rose Hub Initial Assessment</b></p> <p><b>LO: to investigate multiples of given numbers</b>  <b>LO: to find common multiples of two numbers</b>  <b>LO: to investigate factors of a given number</b>  <b>LO: to find common factors of a given number</b>  <b>LO: to investigate prime numbers</b>  <b>LO: to investigate square numbers</b>  <b>LO: to investigate cubed numbers</b>  <b>LO: to multiply by 10, 100 and 1000</b>  <b>LO: to divide by 10, 100 and 1000</b>  <b>LO: to count in and use multiples of 10, 100 and 1000</b></p> <p><b>White Rose Hub End of Block Assessment</b></p> <p><b><u>Arithmetic Focuses:</u></b>  <b>Division with remainders</b></p>	<p><i>Prime number</i>  <i>Composite number</i>  <i>Square number</i>  <i>Cube number</i>  <i>Square</i>  <i>Cube</i>  <i>Inverse Operation</i>  <i>Multiply</i>  <i>Divide</i>  <i>Multiple</i>  <i>Factor</i>  <i>Prime Factor</i></p>	<p>Assessment- WRH entry and exit assessment.</p> <p>Begin with multiplication facts that the children know and discuss how these can be used to help to find other facts. Use inverse pyramids and triangles to see the link between multiplication and division. Divide by 10 and 100 and see real life examples of where this might need to be done. Then link dividing by 10 to one tenth, use fraction parts to show one tenth in relation to a whole. Do the same with one hundredth. Find factors and multiples of numbers and move onto common factors and multiples. Find products of two or more factors and find common factors. Introduce the written methods for multiplication and division and work through starting with 4 x 1 and 4 divided by 1 digit and then move onto 2 digits. Use division strategies that we have been learning in arithmetic starters in class to recap remainders and children to do this independently.</p>

# Year 5- Aut 2 Maths      Context: Multiplication and division

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b>Number: Multiplication and division.</b></p> <p><b>Pathway 3</b></p> <p>5NF-1- Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.</p> <p>5MD- 1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.</p> <p>5MD- 2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.</p> <p>5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.</p> <p>5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.</p>	<p><b>Sequence steps:</b> Topics will be broken down into manageable steps that build on a sequence of learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><b>Adopting the mastery approach:</b> Embedding understanding and develop rich connections across topics.</p> <p><b>Calculating both mentally and in written form</b> – revisiting topics to consolidate understanding.</p> <p><b>Interleaved learning</b> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><b>Solve problems and complete reasoning activities of a more complex nature,</b> using knowledge of facts, concepts and procedures.</p> <p><b>CPA Approach.</b></p> <p><b>Subject vocabulary</b> knowledge and use.</p>	<p><b>Mini WRM assessment entry.</b> LO: to analyse the link between multiplication and division facts. LO: to multiply and divide numbers by 10 and 100. LO: to explain how dividing by 10 is the same as finding one tenth. LO: to explain how dividing by 100 is the same as finding one hundredth. LO: to find factors and multiples of positive numbers. LO: to find common factors and common multiples of a given number. LO: to express a given number as a product of 2 or 3 factors. LO: to multiply any whole number by a one digit number. LO: to use a formal written method to multiply a number with up to 4 digits by a one digit number. LO: to divide a number with up to 4 digits by a 1 digit number using a formal written method. LO: to use a written method for division and interpret remainders effectively.</p> <p><b>Mini WRM assessment exit.</b></p>	<p>multiplication multiply multiplied by multiple, factor groups of times product once, twice, three times ... ten times repeated addition division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally</p>	<p>Assessment- WRH entry and exit assessment.</p> <p>Begin with multiplication facts that the children know and discuss how these can be used to help to find other facts. Use inverse pyramids and triangles to see the link between multiplication and division. Divide by 10 and 100 and see real life examples of where this might need to be done. Then link dividing by 10 to one tenth, use fraction parts to show one tenth in relation to a whole. Do the same with one hundredth. Find factors and multiples of numbers and move onto common factors and multiples. Find products of two or more factors and find common factors. Introduce the written methods for multiplication and division and work through starting with <math>4 \times 1</math> and 4 divided by 1 digit and then move onto 2 digits. Use division strategies that we have been learning in arithmetic starters in class to recap remainders and children to do this independently.</p>

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
Number: Fractions  Pathway 4 fractions	<p>Compare and order fractions whose denominators are multiples of the same number</p> <p>Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths</p> <p>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt;1</math> as a mixed number.</p> <p>Add and subtract fractions with the same denominator and denominators that are multiples of the same number.</p>	<p>LO: to convert mixed numbers to improper fractions.</p> <p>LO: to use fractions in number sequences.</p> <p>LO: to compare and order fractions less than 1</p> <p>LO: to compare and order fractions greater than 1</p> <p>LO: to add and subtract fractions with different denominators</p> <p>LO: to add fractions within one and breaking the whole</p> <p>LO: to know how to add three or more fractions</p> <p>LO: to solve problems involving adding fractions</p> <p>LO: to know how to add mixed fractions</p>	mixed number  denominator  numerator  improper fraction  fraction  decimal  equivalent  equivalence  simplify	<p><b>Mixed numbers to improper fractions:</b> Children are to use manipulatives such as egg boxes and cubes and other physical manipulatives to see when a fraction becomes more than one and then the mixed number that this represents.</p> <p><b>Compare and order:</b> Children to use visual representations of fractions in a variety of ways to order and compare the size of fractions and mixed numbers.</p> <p><b>Add and subtract fractions:</b> Children to firstly add and subtract fractions with the same denominator and then move onto fractions where they need to alter the denominator. Then move on to application of problems such as addition and subtraction fraction pyramids where the children need to apply these skills.</p> <p><b>Solve problems:</b> Children to apply skills of adding and subtracting fractions, comparing and ordering and applying improper fractions and mixed numbers to a range of reasoning problems.</p>

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
Multiplication and division	<p><b>Sequence steps:</b> Topics will be broken down into manageable steps that build on a sequence of learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><b>Adopting the mastery approach:</b> Embedding understanding and develop rich connections across topics.</p> <p><b>Calculating both mentally and in written form</b> – revisiting topics to consolidate understanding.</p> <p><b>Interleaved learning</b> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><b>Solve problems and complete reasoning activities of a more complex nature</b>, using knowledge of facts, concepts and procedures.</p> <p><b>CPA Approach.</b></p> <p><b>Subject vocabulary</b> knowledge and use.</p>	<p>LO: to multiply up to a 4 digit number by a 1 digit number</p> <p>LO: to multiply a 2 digit number by a 2 digit number using the area model</p> <p>LO: to multiply a 2 digit number by a 2 digit number</p> <p>LO: to multiply a 3 and 4 digit number by a 2 digit number</p> <p>LO: to solve problems involving multiplication</p> <p>LO: to know the steps for short division</p> <p>LO: to divide a 4 digit number by 1 digit</p> <p>LO: to divide with remainders</p>	<p>Division</p> <p>Divisor</p> <p>Multiplicand</p> <p>Multiplication</p> <p>Area model</p> <p>remainders</p>	<p>Build on their learning of multiplying by a 1-digit number and begin to multiply by a 2-digit number. Children use the area model to multiply a 2-digit number by another 2-digit number before moving on to the formal written method in the next step. Linking the use of the area model to children's prior knowledge of arrays helps children to understand the model. They see that to find the total product, they can break the calculation down, find other products and then add them together. children progress from the area model to using the formal written method for multiplication.</p> <p>Encourage children to recognise the links between the area model and the formal method, noting where the subtotals in the formal method match the totals of parts of the area model. Children can check their answers by rounding to find estimates, for example <math>42 \times 32</math> is about <math>40 \times 30 = 1,200</math>, so the actual answer should be close to this. Children build on their understanding from the previous two steps to multiply a 4-digit number by a 2-digit number.</p> <p>Children need to be confident with multiplying 2-digit numbers by both 2- and 3-digit numbers before moving on to this step. As they are now working with greater numbers, it is important that children understand the steps taken when using the long multiplication method. Following the introduction of formal short division in the previous step, in this small step children move on to dividing a 4-digit number by a 1-digit number.</p> <p>Place value counters continue to be used to represent the calculations alongside the formal written method, so that children can visualise how one relates to the other. Children begin with divisions that have no exchanges and then</p>

NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
<b>Pathway 4 fractions</b>	<p><b>Sequence steps:</b> Topics will be broken down into manageable steps that build on a sequence of learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><b>Adopting the mastery approach:</b> Embedding understanding and develop rich connections across topics.</p> <p><b>Calculating both mentally and in written form</b> – revisiting topics to consolidate understanding.</p> <p><b>Interleaved learning</b> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><b>Solve problems and complete reasoning activities of a more complex nature</b>, using knowledge of facts, concepts and procedures.</p> <p><b>CPA Approach.</b></p> <p><b>Subject vocabulary</b> knowledge and use.</p>	<p>LO: to multiply a unit fraction by an integer</p> <p>LO: to multiply a non-unit fraction by an integer</p> <p>LO: to multiply a mixed number by an integer</p> <p>LO: to calculate a fraction of a quantity</p> <p>LO: to find a fraction of an amount</p> <p>LO: to use given fractions to find the whole</p> <p>LO: to use fractions as operators</p>	<p>Equivalent Fraction</p> <p>Tenths</p> <p>Hundredths</p> <p>Convert</p> <p>Mixed number</p> <p>Improper fraction</p> <p>Mathematical statement</p> <p>Mixed number</p> <p>Denominator or Numerator</p> <p>Decimal</p>	<p>Children encounter multiplication number sentences with fractions, multiplying unit fractions by an integer.</p> <p>Make links to multiplication as repeated addition. Bar models are a useful representation and can show the calculations in multiple or single bars. When answers are greater than 1, encourage children to write their answers as a mixed number. They may also find a number line useful. Children explore a range of methods to complete the calculations and discuss the efficiency of each. To build understanding, initially calculations should not involve converting improper fractions to mixed numbers. Once children are secure in using the methods, they can explore questions where in the answer, the fractional part of the calculation is greater than 1 and needs converting to a mixed number before combining the totals.</p>



YEAR 6

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# YEAR 6

## Overview

## Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>		Number <b>Addition, subtraction, multiplication and division</b>				Number <b>Fractions A</b>		Number <b>Fractions B</b>		Measurement <b>Converting units</b>	
Spring	Ratio		Algebra		Number <b>Decimals</b>		Number <b>Fractions, decimals and percentages</b>		Measurement <b>Area, perimeter and volume</b>		Statistics	
Summer	Geometry <b>Shape</b>		Geometry <b>Position and direction</b>		Themed projects, consolidation and problem solving							

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Number – <b>Number &amp; place value</b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</li> <li>round any whole number to a required degree of accuracy</li> <li>use negative numbers in context, and calculate intervals across zero</li> <li>solve number and practical problems that involve all of the above</li> </ul>	<p><u>Pathway</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p>Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit. Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning (See RTPC 6NPV-2)</p> <p>Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). (See RTPC 6NPV-1)</p> <p>Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts. See RTPC 6NPV-4</p> <p>Round any whole number to a required degree of accuracy. Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. (See RTPC 6NPV-3)</p> <p>Use negative numbers in context, and calculate intervals across zero Solve number and practical problems that involve all of the above)</p> <p><u>Main lesson Learning Outcomes:</u> L.O: I can <b>partition</b> numbers and know the value of each digit up to 1 million L.O: I can <b>apply</b> my knowledge of place value to solving questions extending to 10 million L.O: I can <b>compare and order</b> integers and decimals up to ten million L.O: I can <b>apply</b> my ability to <b>multiply</b> and <b>divide</b> integers and decimals by 10, 100 and 1000 by explaining relationships between numbers L.O: I can <b>discuss</b> and <b>apply</b> my rounding skills to any number and any degree of accuracy. L.O: I can <b>apply</b> my understanding of rounding to solve problems L.O: I can <b>apply</b> my understanding of negative numbers to make comparisons and justify my answers L.O: I can <b>evaluate</b> my understanding of negative numbers by solving problems in an everyday context</p> <p><u>Complete assessment:</u> <u>White Rose Hub mini assessment:- Place Value Y6</u></p>	<p>Consecutive Negative Zero Temperature Power of Descending order Digit Difference Greater than Integer Less than Ordinal number Place value Roman numerals Rounding Squared Column method Subtraction Addition Exchange</p>	<p>Complete baseline Y5 objective test for all LO coverage from Y5 to then analyse results and plan for class abilities. Use of White Rose and Star assessment material to identify areas/ starting point for class – PLACE VALUE Y5 assessment task and use of Y4 place value task to begin.</p> <p>Continual reinforcement of learning using concrete apparatus like place value charts and White Rose material to model, discuss and teach place value.</p> <p>Children think about when place value important, e.g money and complete a check in to establish the child's starting points in the subject.</p> <p>Base ten, part whole, partitioning shall be used to teach the value of each segment of a given number.</p> <p>Number lines to be used to teach rounding and rules for up and down reinforced using MyMaths teaching material to support main teaching.</p> <p>Use of White Rose Hub material and teaching sequence for lesson content.</p> <p>Encourage use of highlighters to identify key information and chn can generate their own rounding scenario and problem for a peer to solve,</p> <p>Children will explore with whiteboards, with partners and independently the use of the column method. Regular prompts to check calculation strategies. Reference to the White Rose visual prompts on display.</p> <p>Children to apply their methods to written sums to see accuracy and confidence with the methods. Children will apply these strategies when solving problems in context. Some of these questions are also in context to make work more relevant.</p> <p>Refer to online White Rose ppt's referenced in key knowledge with use of challenge/ ready to progress material where necessary.</p> <p>Friday – timetable and arithmetic focus to explore use of written strategies for 2 mark questions.</p> <p>(Challenge – use of ready to progress material, Nrich tasks and reasoning activities to embed and extend LOs in each lesson)</p> <p>(Support chn – pictorial, abstract and concrete representations of each LO to support and scaffold learning where necessary)</p>

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><b><u>Number – addition, subtraction, multiplication and division</u></b></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</li> <li>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</li> <li>perform mental calculations, including with mixed operations and large numbers</li> <li>identify common factors, common multiples and prime numbers</li> <li>use their knowledge of the order of operations to carry out calculations involving the four operations</li> <li>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> </ul>	<p><b><u>Pathway 2 – addition, subtraction, multiplication and division</u></b></p> <p><b><u>Sequence steps:</u></b> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><b><u>Adopting the mastery approach:</u></b> Embedding understanding and develop rich connections across topics.</p> <p><b><u>Calculating both mentally and in written form</u></b> – revisiting topics to consolidate understanding.</p> <p><b><u>Interleaved learning</u></b> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><b><u>Solve problems and complete reasoning activities of a more complex nature</u></b>, using knowledge of facts, concepts and procedures.</p> <p><b><u>CPA Approach.</u></b></p> <p><b><u>Subject vocabulary</u></b> knowledge and use.</p>	<p>LO: I can <b>apply</b> a strategy to add two 4-digit numbers using one or more exchange in column method. .</p> <p>LO: I can <b>apply</b> a calculation strategy to subtract two 4-digit numbers using more than one exchange.</p> <p>LO: I can <b>solve</b> calculations problems using an addition and subtraction method for number</p> <p>LO: I can <b>identify and investigate</b> common factors and multiples to solve problems</p> <p>LO: I can <b>apply</b> my knowledge of rules of divisibility and prime numbers to <b>solve</b> problems</p> <p>LO: To <b>investigate</b> methods for multiplication including formal written method for 4 digits by 2 digit whole numbers.</p> <p>LO: To <b>apply</b> a written strategy for division up to 4 digits by 2 digits and interpret remainders as whole numbers</p> <p>LO: To apply my learning to solve multi-step problems including all 4 operations</p> <p>LO: I can <b>justify</b> my answers by using the inverse operations to check the answers my calculations.</p> <p>LO: I can <b>solve</b> addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p> <p><b>White Rose Hub mini assessment – on topic</b></p> <p>(Challenge – use of ready to progress material, Nrich tasks and reasoning activities to embed and extend LOs in each lesson)</p> <p>(Support chn – pictorial, abstract and concrete representations of each LO to support and scaffold learning where necessary)</p>	<p>Difference Inverse Operation Column addition Column subtraction Written methods Integer Rounding Sum Inverse Addition Column</p>	<p>Children complete the White Rose Maths baseline test Y5 at the beginning of the unit to establish a starting point to the unit.</p> <p>Children use the formal column method for numbers with the same and different numbers of digits. They also practise mental strategies with both large and small numbers, using their understanding of place value. Children solve multi-step problems, choosing which operations and methods to use based on the context of the problem and the types of numbers involved. The use of concrete manipulatives can support children's understanding, especially where exchanges are required.</p> <p>Children are familiar with the idea of multiples of numbers from earlier study of times-tables. Building on this knowledge, they now find common multiples of two or more numbers. As with factors, arrays and other representations may still be used as support, but knowledge of times-tables is key. Some multiples can be recognised using the rules of divisibility, which are explored in detail in the next small step. Encourage children to work systematically to find lists of multiples rather than just finding the product of the given numbers, as this may miss some multiples. Children do not need to be able to formally identify the lowest common multiple of two or more numbers, but can be challenged to consider the first common multiple of a pair of numbers.</p> <p>Building on their learning from previous years, children use long multiplication to multiply numbers with up to four digits by 2-digit numbers. Children should already be aware that multiplication is commutative, so answers to calculations such as <math>56 \times 1,234</math> can be found by rewriting as <math>1,234 \times 56</math> and using the standard format. Children also solve word problems and/or multi-step problems. This will be revisited in the next step, where alternative strategies are also explored, for example for multiplying by 9 or 99 Children who require additional support may benefit from revising multiplication of 2- or 3-digit numbers by a single digit before moving on to multiplication by a 2-digit number.</p> <p>Children to use BIDMAS/BODMAS as a reference and solve mixed order calculations. Children will use whiteboards to remind themselves of the strategies and checking process.</p> <p>Board modelling by teacher will help remind children of addition and subtraction, stressing the inclusion checking by inverse.</p> <p>Chn to complete arithmetic strategies – all 4 operations and then applying to written problems. Encourage children to use a highlighter to identify key parts of the question as we would in sets. Children reasoning their understanding using spot the mistake, convince me and true/false activities.</p> <p>For word problems, children use the mnemonic RUCSAC to organise their thinking and establishing the starting points for their problem solving. Teacher modelling and paired work to show how to establish which method to use, what order and how to check with inverse</p>

# Year 6- Aut 1 Maths - Diagnostic outcome intervention

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Number &amp; place value</p> <p>Fractions</p> <p>Data handling/ statistics</p> <p>Multiplication and division</p> <p>Decimals</p> <p>Percentages</p> <p>Addition and Subtraction - problems</p> <p>Angles</p> <p>3D Shape</p>	<p><u>Pathway</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p>L.O: I can apply a written method for subtraction to solve problems</p> <p>L.O: I can reflect a given shape recording its coordinates</p> <p>L.O: I can calculate equivalent fractions and order them appropriately</p> <p>L.O: I can apply my understanding of equivalences to add and subtract fractions</p> <p>L.O: I can multiply fractions</p> <p>L.O: I can identify multiples</p> <p>L.O: I can round decimals</p> <p>L.O: I can multiply and divide numbers by 10, 100 and 1000</p> <p>L.O: I can convert between fractions, Decimals and Percentages</p> <p>L.O: I can order decimals according to size</p> <p>L.O: I can interpret and calculate differences in data presented in a line graph</p> <p>L.O: I can solve 2 step problems involving addition and subtraction</p> <p>L.O: I can calculate missing angles around a point</p> <p>L.O: I can identify 3D shapes</p>	<p>Consecutive</p> <p>Negative</p> <p>Zero</p> <p>Temperature</p> <p>Power of</p> <p>Descending order</p> <p>Digit</p> <p>Difference</p> <p>Greater than</p> <p>Integer</p> <p>Less than</p> <p>Ordinal number</p> <p>Place value</p> <p>Roman numerals</p> <p>Rounding</p> <p>Squared</p> <p>Column method</p> <p>Subtraction</p> <p>Addition</p> <p>Exchange</p>	<p><u>LO1</u> Word problems involving column subtraction with missing digits. Then apply into worded problems where subtraction is needed.</p> <p>L.O2 Shapes are reflected and associated co-ordinates are recorded on the grid. (x,y) Using a 2 quadrant grid and extend to 4 for more able.</p> <p>L.O3 Children to give a collection of fractions to calculate their equivalents, following this children are then taught to order them - ascending and descending.</p> <p>L.O4 Children calculate fraction equivalences and use them to add and subtract fractions in arithmetic style question format. Include mixed fractions to extend where appropriate.</p> <p>L.O5 Children apply their understanding to multiply fractions. Present problems visually as well as written sums. Extend – children calculate simplified form.</p> <p>L.O6 Children need to identify multiples of a given number. To extend, children are given sets of numbers and must identify what number they are multiples of.</p> <p>L.O7 Children apply rules of rounding to decimals (1d.p) and whole number (10, 100, 1000)</p> <p>L.O8 Children learn rules for rounding and apply to given numbers including decimals and numbers context.</p> <p>L.O9 Children can recognize the relationship between FDPs and use to then calculate them. Present children with written problems to challenge and apply their understanding.</p> <p>L.O10 Children can recognise place value in decimals in order to then order them accordingly.</p> <p>L.O11 Children interpret line graphs looking at the information displayed, analyse what is shown and calculate the differences. Word problems given to support the skills.</p> <p>L.O12 Children identify the key information needed to solve a problem and solve using a written method for + and -.</p> <p>L.O13 Children must recognise that 360 degrees is around a point and use this knowledge to calculate missing angles.</p> <p>L.O14 Children identify 3d shapes based upon their known properties.</p>

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Children should be taught to: recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</p>	<p><u>Pathway 9 – Percentages</u>  <u>Sequence steps:</u>            Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u>            Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u>            Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>Pathway 9 Percentages</u>  <u>(No RTP)</u></p> <ul style="list-style-type: none"> <li>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</li> <li>Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison</li> <li>Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.</li> </ul> <p><u>L.O: I can calculate equivalent fractions, decimals and percentages</u></p> <p><u>L.O: I can order and compare FDP</u></p> <p><u>L.O: I can calculate percentages of amounts</u></p> <p><u>L.O: I can solve percentage problems</u></p> <p><u>L.O: I can apply my skills to arithmetic questions</u></p> <p><u>SPRING TEST 2</u></p>	<p>Decimal</p> <p>Place value</p> <p>Equivalent</p> <p>Compare</p> <p>Ascending</p> <p>Descending</p> <p>Relationship</p> <p>Tenths,</p> <p>hundredths,</p> <p>thousands</p> <p>Rounding</p> <p>Percentage</p> <p>Fraction</p>	<p><u>Retrieval task</u>            Children are introduced to 'per cent' for the first time and will understand that 'per cent' relates to 'number of parts per hundred'. They will explore this through different representations which show different parts of a hundred. Children will use 'number of parts per hundred' alongside the % symbol.</p> <p><i>Refer to White Rose teaching PPTs saved in shared area Y6, MATHS, SPRING 1.</i></p> <p>6P- PPT1 and resources. 1 Children will be familiar with converting some common fractions from their work. They learn to convert fractions to equivalent fractions where the denominator is 100 in order to find the percentage equivalent.</p> <p>6P – PPT 2 Children apply their knowledge of common equivalent fractions and decimals to find the equivalent percentage. A common misconception is that 0.1 is equivalent to 1%. Use of diagrams to support understanding the difference between tenths and hundredths and their equivalent percentages.</p> <p>6P – PPT 3 Children convert between fractions, decimals and percentages to enable them to order and compare them. Encourage them to convert each number to the same form so that they can be more easily ordered and compared. Once the children have compared the numbers, they will need to put them back into the original form to answer the question. Use of differentiated test questions from SATs papers and TA/ resources support for LA to visualise the relationships/ equivalences between all three forms.</p> <p>6P – PPT 4 Children use known fractional equivalences to find percentages of amounts. Bar models and other visual representations may be useful in supporting this e.g. <math>25\% = \frac{1}{4}</math> so we divide into 4 equal parts. In this step, we focus on 50%, 25%, 10% and 1% only. Children build on the last step by finding multiples of 10% and other known percentages. They explore different methods of finding certain percentages e.g. Finding 20% by dividing by 10 and multiplying by 2 or by dividing by 5. They also explore finding 5% by finding half of 10%. Using these methods, children build up to find percentages such as 35%.</p> <p>6P– PPT 5 Children use their understanding of percentages to find the missing whole or a missing percentage when the other values are given. They may find it useful to draw a bar model to help them see the relationship between the given percentage or amount and the whole. It is important that children see that there may be more than one way to solve a problem and that some methods are more efficient than others Q. If we know the value and percentage, can we find the whole?</p> <p>MyMaths unit set for chn to consolidate and review learning points where needed.</p> <p><b>Mini WRM assessment exit.</b></p>

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><u>Fractions: calculations</u></p> <ul style="list-style-type: none"> <li>add and subtract fractions with different denominators and mixed numbers</li> <li>multiply simple pairs of proper fractions</li> <li>divide proper fractions by whole</li> <li>associate a fraction with division and calculate decimal fraction equivalents</li> </ul>	<p><u>Pathway 4 – Fractions</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<ul style="list-style-type: none"> <li>6F-2: Autumn 3 Fractions</li> <li>Add fractions</li> <li>Subtract fractions</li> <li>Mixed addition and subtraction</li> <li>Four rules with fractions</li> </ul> <p>L.O: I can <b>multiply</b> simple pairs of proper fractions, writing the answer in its simplest form [for example <math>14 \times 12 = 168</math>]</p> <p>L.O: I can <b>divide</b> proper fractions by whole numbers [for example <math>13 \div 2 = 6.5</math>]</p> <p>L.O: I can associate a fraction with division and calculate decimal fraction equivalents</p> <p>L.O: I can <b>recall</b> and <b>use</b> equivalences between fractions, decimals and percentages including different contexts.</p> <p>L.O: I can <b>reflect</b> upon my understanding of the fraction topic</p> <p>White Rose Maths Hub assessment</p>	<p>Fraction</p> <p>Proper/ improper fraction</p> <p>Equivalent fraction</p> <p>Mixed number</p> <p>Numerator</p> <p>Denominator</p> <p>Reduced to, cancel</p> <p>Equal part</p> <p>Equal grouping</p> <p>Equal sharing</p> <p>Parts of a whole</p> <p>Quarter, two quarters</p> <p>Half, two halves</p> <p>Sixths, sevenths, eighths, tenths</p> <p>Decimal, decimal fraction</p> <p>Simplify</p> <p>Compare</p> <p>Order</p>	<p><b>REFER TO 6F-2 and 6F3 ppt</b></p> <p>Children apply what their understanding of equivalence and fraction value to multiply fractions and mixed numbers by integers. Use diagrams to identify the link between multiplication and repeated addition. Use models and manipulatives to show that the numerator is multiplied and the denominator stays the same. Teacher models how to multiply with mixed numbers, showing the children how to partition into wholes and parts to multiply more efficiently. They then compare the strategy with multiplying improper fractions.</p> <p>L/A – supported with concrete models and visual representations to support them with multiplying. Use MyMaths sessions to support LA with visualising (interlinking cubes) and use of fraction bricks to see the equivalences between fractions and relationship when converting improper to mixed fractions. Encourage them to explore creating models then recording in writing what the process is. E.G, <math>3/2 = 1 \frac{1}{2}</math>.</p> <p>Refer to 6F2 to model process of converting and ordering fractions with different denominations on a number line. Show various representations of fractions on a number line with missing numerators and denominators for children to apply their understanding of conversion to then order.</p>

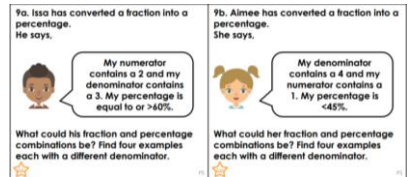


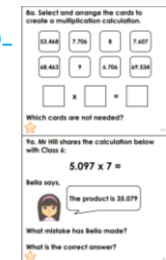

# Year 6- Aut 2- Maths Diagnostic outcome intervention

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Number &amp; place value</p> <p>Fractions</p> <p>Data handling/ statistics</p> <p>Multiplication and division</p> <p>Decimals</p> <p>Percentages</p> <p>Addition and Subtraction - problems</p> <p>Angles</p> <p>3D Shape</p>	<p><u>Pathway</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p>L.O: I can apply a written method for subtraction to solve problems</p> <p>L.O: I can reflect a given shape recording its coordinates</p> <p>L.O: I can calculate equivalent fractions and order them appropriately</p> <p>L.O: I can apply my understanding of equivalences to add and subtract fractions</p> <p>L.O: I can multiply fractions</p> <p>L.O: I can identify multiples</p> <p>L.O: I can round decimals</p> <p>L.O: I can multiply and divide numbers by 10, 100 and 1000</p> <p>L.O: I can convert between fractions, Decimals and Percentages</p> <p>L.O: I can order decimals according to size</p> <p>L.O: I can interpret and calculate differences in data presented in a line graph</p> <p>L.O: I can solve 2 step problems involving addition and subtraction</p> <p>L.O: I can calculate missing angles around a point</p> <p>L.O: I can identify 3D shapes</p>	<p>Consecutive</p> <p>Negative</p> <p>Zero</p> <p>Temperature</p> <p>Power of</p> <p>Descending order</p> <p>Digit</p> <p>Difference</p> <p>Greater than</p> <p>Integer</p> <p>Less than</p> <p>Ordinal number</p> <p>Place value</p> <p>Roman numerals</p> <p>Rounding</p> <p>Squared</p> <p>Column method</p> <p>Subtraction</p> <p>Addition</p> <p>Exchange</p>	<p><u>LO1</u> Word problems involving column subtraction with missing digits. Then apply into worded problems where subtraction is needed.</p> <p>L.O2 Shapes are reflected and associated co-ordinates are recorded on the grid. (x,y) Using a 2 quadrant grid and extend to 4 for more able.</p> <p>L.O3 Children to give a collection of fractions to calculate their equivalents, following this children are then taught to order them - ascending and descending.</p> <p>L.O4 Children calculate fraction equivalences and use them to add and subtract fractions in arithmetic style question format. Include mixed fractions to extend where appropriate.</p> <p>L.O5 Children apply their understanding to multiply fractions. Present problems visually as well as written sums. Extend – children calculate simplified form.</p> <p>L.O6 Children need to identify multiples of a given number. To extend, children are given sets of numbers and must identify what number they are multiples of.</p> <p>L.O7 Children apply rules of rounding to decimals (1d.p) and whole number (10, 100, 1000)</p> <p>L.O8 Children learn rules for rounding and apply to given numbers including decimals and numbers context.</p> <p>L.O9 Children can recognize the relationship between FDPs and use to then calculate them. Present children with written problems to challenge and apply their understanding.</p> <p>L.O10 Children can recognise place value in decimals in order to then order them accordingly.</p> <p>L.O11 Children interpret line graphs looking at the information displayed, analyse what is shown and calculate the differences. Word problems given to support the skills.</p> <p>L.O12 Children identify the key information needed to solve a problem and solve using a written method for + and -.</p> <p>L.O13 Children must recognise that 360 degrees is around a point and use this knowledge to calculate missing angles.</p> <p>L.O14 Children identify 3d shapes based upon their known properties.</p>

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p><u>Fractions Compare</u></p> <p>Use common fractions to simplify fractions;</p> <p>Use common multiples to express fractions in the same denomination</p> <p>Compare and order fractions including fractions &gt;1</p>	<p><u>Pathway 4 – Fractions</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<ul style="list-style-type: none"> <li>6F-1: Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</li> <li>6F-2: Compare and order fractions, including fractions &gt; 1. Express fractions in a common denomination and use this to compare fractions that are similar in value.</li> <li>6F-3: Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy</li> </ul> <p>LO: I can <b>calculate</b> common factors to simplify fractions</p> <p>LO: I can <b>apply</b> common multiples to find equivalent fractions and common factors to simplify fractions</p> <p>LO: I can <b>compare</b> and order fractions, including improper fractions</p> <p>LO: I can <b>add</b> and <b>subtract</b> fractions with different denominations and mixed numbers</p> <p>LO: To <b>apply</b> my arithmetic skills to assessment questions (Friday arithmetic lesson)</p>	<p>Fraction</p> <p>Proper/ improper fraction</p> <p>Equivalent fraction</p> <p>Mixed number</p> <p>Numerator</p> <p>Denominator</p> <p>Reduced to, cancel</p> <p>Equal part</p> <p>Equal grouping</p> <p>Equal sharing</p> <p>Parts of a whole</p> <p>Quarter, two quarters</p> <p>Half, two halves</p> <p>Sixths, sevenths, eighths, tenths</p> <p>Decimal, decimal fraction</p> <p>Simplify</p> <p>Compare</p> <p>Order</p>	<p>Retrieval – ask children to identify what they know about fractions. Ask if they can recall any real life scenarios when they might need to use fractions? What methods do they know related to fraction calculations? Model a few examples to assess understanding of children – are they ready to move to abstract reference of fractions or pictorial needed to support.</p> <p>REFER TO 6F-1 ppt – Children use their understanding of the HCF to simplify fraction, building upon their knowledge of equivalent fractions. Children apply their understanding when calculating with fractions and simplifying their answers accordingly. Encourage children to use pictorial representations to support their simplifications – fraction wall to be provided as a reference in books and on display on class working wall. Children convert improper fractions to mixed numbers for the first time. Children will see visual representations of the process to allow them to make connections between the concept happening and the abstract.</p> <p>L/A – supported with concrete models (interlinking cubes) and use of fraction bricks to see the equivalences between fractions and relationship when converting improper to mixed fractions. Encourage them to explore creating models then recording in writing what the process is.</p> <p>E.G. <math>3/2 = 1 \frac{1}{2}</math>.</p> <p>Refer to 6F2 to model process of converting and ordering fractions with different denominations on a number line. Show various representations of fractions on a number line with missing numerators and denominators for children to apply their understanding of conversion to then order. Children apply their knowledge equivalence between fractions to add when they have the same denominations.</p> <p><u>MyMaths unit</u> – assigned to class. Tasks include: order and compare fractions Y6, add and subtract fractions Y6. These used alongside teaching.</p>

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<p>Children should be taught to:</p> <ul style="list-style-type: none"> <li>- 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</li> <li>multiply one-digit numbers with up to two decimal places by whole numbers.</li> <li>- use written division methods in cases where the answer has up to two decimal places</li> <li>solve problems which require answers to be rounded to specified degrees of accuracy</li> <li>recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> </ul>	<p><u>Pathway 9 – Decimals</u></p> <p><u>Sequence steps:</u></p> <p>Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u></p> <p>Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>Pathway 9 Decimals</u> (No RTP)</p> <p>Identify the value of each digit in numbers given to 3 decimal places</p> <p>Multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places</p> <p><u>L.O: I can apply my knowledge to identify the value of each digit in a decimal (up to 3.d.p)</u></p> <p><u>L.O: I can confidently multiply and divide decimals by 10, 100 and 1000</u></p> <p><u>L.O: I can solve problems involving decimals rounded to a specific degree of accuracy</u></p> <p><u>Measures</u></p> <p><u>L.O: I can convert between metric measures</u></p> <p><u>L.O: I can solve problems involving measures</u></p> <p><u>Intro algebra</u></p> <p><u>L.O: I can express missing numbers problems algebraically</u></p> <p><u>L.O: I can use a simple formulae</u></p> <p><u>L.O: I can generate and describe linear number sequences</u></p>	<p>Decimal</p> <p>Place value</p> <p>Equivalent</p> <p>Compare</p> <p>Ascending</p> <p>Descending</p> <p>Relationship</p> <p>Tenths,</p> <p>hundredths,</p> <p>thousands</p> <p>Rounding</p> <p>Percentage</p> <p>Fraction</p>	<p><i>Retrieval – ask children to identify what they know about decimals. Ask if they can recall any real life scenarios when they might need to use them? What methods do they know related to decimal calculations? Model a few examples to assess understanding of children – are they ready to move to abstract reference of decimals or pictorial needed to support. (place value grids/ counters to be used regularly)</i> <b>REFER TO 6D-1 ppt</b> – Children use place value counters and a place value grid to make numbers with up to two decimal places. They read and write decimal numbers and understand the value of each digit. They show their understanding of place value by partitioning decimal numbers in different ways. <b>*REFER to 5D ppt</b></p> <p><b>REFER TO 6D-3-ppt</b></p> <p>Children multiply numbers with up to three decimal places by 10, 100 and 1,000 They discover that digits move to the left when they are multiplying and use zero as a place value holder. The decimal point does not move. Once children are confident in multiplying by 10, 100 and 1,000, they use these skills to investigate multiplying by multiples of these numbers e.g. <math>2.4 \times 20</math></p> <p><u>Measures</u></p> <p>Building on their experiences from earlier years, children recognise, read and write all metric measures for length, mass and capacity. This is the first time they will be introduced to tonnes as a measure for mass. Children need to know that one mile is a greater distance than one kilometer. They learn that 5 miles is approximately equal to 8 km. Using this fact, they solve conversions from miles to kilometres and from kilometres to miles. Children need to know that the symbol “<math>\approx</math>” means “is approximately equal to”.</p> <p><b>Mini WRM assessment exit.</b></p> <p><u>MyMaths unit</u> – assigned to class. Tasks include:</p>

NC PoS	Key Concepts Link	Key Competencies	Vocabulary	Activity
<p>Children should be taught to: recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</p>	<p><u>Pathway 9 – Percentages</u>  <u>Sequence steps:</u>            Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u>            Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u>            Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>Pathway 9 Percentages</u>  <u>(No RTP)</u></p> <ul style="list-style-type: none"> <li>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</li> <li>Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison</li> <li>Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.</li> </ul> <p><u>L.O: I can calculate equivalent fractions, decimals and percentages</u>  <u>L.O: I can order and compare FDP</u>  <u>L.O: I can calculate percentages of amounts</u>  <u>L.O: I can solve percentage problems</u>  <u>L.O: I can apply my skills to arithmetic questions</u>  <u>SPRING TEST 2</u></p>	<p>Decimal            Place value            Equivalent            Compare            Ascending            Descending            Relationship            Tenths,            hundredths,            thousands            Rounding            Percentage            Fraction</p>	<p><u>Retrieval task</u>            Children are introduced to 'per cent' for the first time and will understand that 'per cent' relates to 'number of parts per hundred'. They will explore this through different representations which show different parts of a hundred. Children will use 'number of parts per hundred' alongside the % symbol.</p> <p><i>Refer to White Rose teaching PPTs saved in shared area Y6, MATHS, SPRING 1.</i></p> <p><u>Differentiated groups based upon 6AM Maths Autumn data outcomes.</u>            6P- PPT1 and resources. 1 Children will be familiar with converting some common fractions from their work. They learn to convert fractions to equivalent fractions where the denominator is 100 in order to find the percentage equivalent.</p> <p><u>EXPAND-</u></p> <div data-bbox="1490 625 1898 799">  </div> <p>6P – PPT 2 Children apply their knowledge of common equivalent fractions and decimals to find the equivalent percentage. A common misconception is that 0.1 is equivalent to 1%. Use of diagrams to support understanding the difference between tenths and hundredths and their equivalent percentages.</p> <p><u>EXTEND-</u> Identify if the statement is true or false. Explain your reasoning.  <math>\frac{1}{4} = 40\%</math></p> <p>6P – PPT 3 Children convert between fractions, decimals and percentages to enable them to order and compare them. Encourage them to convert each number to the same form so that they can be more easily ordered and compared. Once the children have compared the numbers, they will need to put them back into the original form to answer the question. Use of differentiated test questions from SATs papers and TA/ resources support for LA to visualise the relationships/ equivalences between all three forms.</p> <p><u>CHALLENGE-</u></p> <p>Alex has written the following fractions, decimals and percentages in ascending order:    0.02, 0.201, 21%, <math>\frac{1}{2}</math>, 52%, 0.5205, 0.77, <math>\frac{7}{70}</math></p> <p>Identify an error that Alex has made, then write the correct answer.</p> <p>6P – PPT 4 Children use known fractional equivalences to find percentages of amounts. Bar models and other visual representations may be useful in supporting this e.g. <math>25\% = \frac{1}{4}</math> so we divide into 4 equal parts. In this step we focus on 50%</p>

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<p>Children should be taught to:</p> <ul style="list-style-type: none"> <li>- 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</li> <li>multiply one-digit numbers with up to two decimal places by whole numbers.</li> <li>- use written division methods in cases where the answer has up to two decimal places</li> <li>solve problems which require answers to be rounded to specified degrees of accuracy</li> <li>recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> </ul>	<p><u>Pathway 9 – Decimals</u></p> <p><u>Sequence steps:</u></p> <p>Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u></p> <p>Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>Pathway 9 Decimals</u> (No RTP)</p> <p>Identify the value of each digit in numbers given to 3 decimal places</p> <p>Multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places</p> <p><u>L.O: I can apply my knowledge to identify the value of each digit in a decimal (up to 3.d.p)</u></p> <p><u>L.O: I can confidently multiply and divide decimals by 10, 100 and 1000</u></p> <p><u>L.O: I can solve problems involving decimals rounded to a specific degree of accuracy</u></p> <p><u>Measures</u></p> <p><u>L.O: I can convert between metric measures</u></p> <p><u>L.O: I can solve problems involving measures</u></p> <p><u>Intro algebra</u></p> <p><u>L.O: I can express missing numbers problems algebraically</u></p> <p><u>L.O: I can use a simple formulae</u></p> <p><u>L.O: I can generate and describe linear number sequences</u></p>	<p>Decimal</p> <p>Place value</p> <p>Equivalent</p> <p>Compare</p> <p>Ascending</p> <p>Descending</p> <p>Relationship</p> <p>Tenths,</p> <p>hundredths,</p> <p>thousands</p> <p>Rounding</p> <p>Percentage</p> <p>Fraction</p>	<p><i>Retrieval – ask children to identify what they know about decimals. Ask if they can recall any real life scenarios when they might need to use them? What methods do they know related to decimal calculations? Model a few examples to assess understanding of children – are they ready to move to abstract reference of decimals or pictorial needed to support. (place value grids/ counters to be used regularly)</i> <b>Differentiated groups based upon Maths Autumn data outcomes.</b></p> <p>REFER TO 6D-1 ppt – Children use place value counters and a place value grid to make numbers with up to two decimal places. They read and write decimal numbers and understand the value of each digit. They show their understanding of place value by partitioning decimal numbers in different ways. *REFER to 5D ppt</p> <p>REFER TO 6D-3-ppt</p> <p>Children multiply numbers with up to three decimal places by 10, 100 and 1,000 They discover that digits move to the left when they are multiplying and use zero as a place value holder. The decimal point does not move. Once children are confident in multiplying by 10, 100 and 1,000, they use these skills to investigate multiplying by multiples of these numbers e.g. <math>2.4 \times 20</math></p> <p><b>CHALLENGE AND EXPAND-</b></p>  <p><b>Measures</b></p> <p>Building on their experiences from earlier years, children recognise, read and write all metric measures for length, mass and capacity. This is the first time they will be introduced to tonnes as a measure for mass. Children need to know that one mile is a greater distance than one kilometer. They learn that 5 miles is approximately equal to 8 km. Using this fact, they solve conversions from miles to kilometres and from kilometres to miles. Children need to know that the symbol “<math>\approx</math>” means “is approximately equal to”.</p> <p><b>CHALLENGE-</b></p>  <p>Natalia and Christian measure the height of a classroom using two</p>



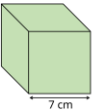
NC PoS	Key Concepts	Key Competencies	Key Vocabulary	Key Activities
<p>Children should be taught to:</p> <p>Recognise that shapes with the same areas can have different perimeters and vice versa</p> <p>recognise when it is possible to use formulae for area and volume of shapes</p> <p>calculate the area of parallelograms and triangles</p> <p>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (<math>\text{cm}^3</math>) and cubic metres (<math>\text{m}^3</math>), and extending to other units [for example, <math>\text{mm}^3</math> and <math>\text{km}^3</math>]</p>	<p><u>Pathway 5 – Measurements</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>L.O: I can investigate relationships between area and perimeter e.g. shapes with the same area can have different perimeters and vice versa.</u></p> <p><u>L.O: I can calculate the volume of 3d shapes using a formula where possible</u></p> <p><u>L.O: I can calculate the area of parallelograms and triangles.</u></p> <p><u>L.O: I can calculate, estimate and make comparisons of the volume of cubes and cuboids</u></p> <p><u>Homework</u> <u>MyMaths – area, perimeter and volume tasks set</u></p>	<p>Decimal</p> <p>Place value</p> <p>Equivalent</p> <p>Compare</p> <p>Ascending</p> <p>Descending</p> <p>Relationship</p> <p>Tenths,</p> <p>hundredths,</p> <p>thousands</p> <p>Rounding</p> <p>Percentage</p> <p>Fraction</p>	<p><b>Retrieval task – What is area? Perimeter? Can they relate to their use of formulas from previous Algebra unit to record their understanding of the two operations. Length and width identified and measures recapped to support chn in their calculations.</b></p> <p><b>REFER TO 6APV-1 ppt</b></p> <p>Children will find and draw rectilinear shapes that have the same area. Children will use their knowledge of factors to draw rectangles with different areas. They will make connections between side lengths and factors.</p> <p>What do we need to know in order to work out the area of a shape? Why is it useful to know your times-tables when calculating area? Can you have a square with an area of <math>48 \text{ cm}^2</math>? Why?</p> <p><b>EXTEND</b></p> <p><b>REFER TO 6APV-2 ppt</b></p> <p>Children should calculate area and perimeter of rectilinear shapes. They must have the conceptual understanding of the formula for area by linking this to counting squares. Writing and using the formulae for area and perimeter is a good opportunity to link back to the algebra block. Children explore that shapes with the same area can have the same or different perimeters.</p> <p><b>EXPAND – CONVINCE ME</b></p> <p><b>REFER TO 6APV-3 ppt:</b> Children will use their previous knowledge of approximating and estimating to work out the area of a triangle by counting. Children will need to physically annotate to avoid repetition when counting the squares. Children will begin to see the link between the area of a triangle and the area of a rectangle or square. They see that a right-angled triangle with the same length and perpendicular height as a rectangle will have an area half the size. Using the link between the area of a rectangle and a triangle, children will learn and use the formula to calculate the area of a triangle.</p> <p><b>REFER TO 6APV-4 ppt</b></p> <p><b>CHALLENGE</b></p> <p>Children use their knowledge of finding the area of a rectangle to find the area of a parallelogram. Children investigate the link between the area of a rectangle and parallelogram by cutting a parallelogram so that it can be rearranged into a rectangle. This will help them understand why the formula to find the area of parallelograms works.</p>



NC PoS	Key Concepts Link	Key Competencies	Key Vocabulary	Key Activities
<p>Pupils should be taught to:</p> <p>solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts</p> <p>solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison</p> <p>solve problems involving similar shapes where the scale factor is known or can be found</p> <p>solve problems involving unequal sharing and grouping using knowledge of fractions and multiples</p>	<p><u>Pathway 10—Ratio</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> — revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning.</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature,</u> using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>L.O: I can divide a quantity in a given ratio (recognising the proportion as a fraction of the whole).</u></p> <p><u>L.O: I can identify that a problem can be written as a ratio and solve problems using this relationship.</u></p> <p><u>L.O: I can solve problems involving similar shapes where the scale factor is known or can be found.</u></p>	<p>Decimal</p> <p>Place value</p> <p>Equivalent</p> <p>Compare</p> <p>Ascending</p> <p>Descending</p> <p>Relationship</p> <p>Tenths,</p> <p>hundredths,</p> <p>thousands</p> <p>Rounding</p> <p>Percentage</p> <p>Fraction</p>	<p><b>REFER TO 6APV-5 ppt</b></p> <p>Children understand that volume is the amount of solid space something takes up. They look at how volume is different to capacity, as capacity is related to the amount a container can hold. Children could use centimetre cubes to make solid shapes. Through this, they recognise the conservation of volume by building different solids using the same amount of centimetre cubes. Children should understand that volume is the space occupied by a 3-D object. Children will start by counting cubic units (<math>1 \text{ cm}^3</math>) to find the volume of 3D shapes. They will then use cubes to build their own models and describe the volume of the models they make.</p> <p><b>REFER TO 6APV-6 ppt</b></p> <p>Children make the link between counting cubes and the formula (<math>l \times w \times h</math>) for calculating the volume of cuboids. They realise that the formula is the same as calculating the area of the base and multiplying this by the height.</p> <p><b>EXTEND</b></p> <p><b>Area, Perimeter &amp; Volume WRM assessment completed.</b></p> <p><b>REFER TO 6R-1 ppt — introduction to Ratio.</b></p> <p>Children will understand that a ratio shows the relationship between two values and can describe how one is related to another. They will start by making simple comparisons between two different quantities. For example, they may compare the number of boys to girls in the class and write sta</p> <p><b>EXPAND</b></p> <p><b>1. Each class has been collecting reply slips to show how many people plan on attending the fair. The information gathered shows that for every two adults attending the fair, there will be 3 children. Write this as a ratio.</b></p> <p><b>REFER TO 6R-2 ppt</b></p> <p>Children often think a ratio 1 : 2 is the same as a fraction of <math>\frac{1}{2}</math>. In this step, they use objects and diagrams to compare ratios and fractions.. Children are introduced to the colon notation as the ratio symbol, and continue to link this with the language 'for every... there are...' They need to read ratios e.g. 3 : 5 as "three to five". Children understand that the notation relates to the order of parts. For example, 'For every 3 bananas there are 2 apples would be the same as 3 : 2 and for every 2 apples there are 3 bananas would be the same as 2 : 3.</p> <p><b>CHALLENGE</b></p> <p><b>REFER TO 6R-3 ppt</b></p> <p>Children build on their knowledge of ratios and begin to calculate ratios. They answer worded questions in the form of 'for every... there are ...' and need to be able to find both a part and a whole. They should be encouraged to draw bar models to represent their problems, and clearly label the information they have been given and what they want to calculate</p>

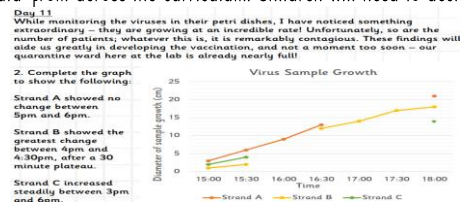
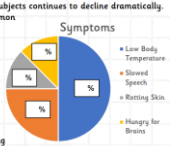
TRUE OR FALSE?

There is not enough information to calculate the volume of this cube.



7. The face painting stall was very popular, with 64 children visiting on the first day. Children could choose from either a butterfly, a zombie or a tiger. For every 3 butterflies, there was 1 zombie and 4 tigers. How many of each face painting type were there?



NC PoS	Key Concepts Link	Key Competencies	Key Vocabulary	Key Activities
<p>Children should be taught to:</p> <p>Interpret and construct pie charts and line graphs and use these to solve problems</p> <p>Calculate the mean as an average</p> <p>Illustrate and name parts of a circles, including radius, diameter and circumference and know that the diameter is twice the radius</p>	<p><u>Pathway – 8 Statistics</u></p> <p><u>Sequence steps:</u> Topics will be broken down into manageable steps that build on a sequence of steps in learning where mathematical concepts are connected in order to ensure there is a real depth of understanding.</p> <p><u>Adopting the mastery approach:</u> Embedding understanding and develop rich connections across topics.</p> <p><u>Calculating both mentally and in written form</u> – revisiting topics to consolidate understanding.</p> <p><u>Interleaved learning.</u> Encouraging pupils to successfully commit previous learning into their long term memory.</p> <p><u>Solve problems and complete reasoning activities of a more complex nature</u>, using knowledge of facts, concepts and procedures.</p> <p><u>CPA Approach.</u></p> <p><u>Subject vocabulary</u> knowledge and use.</p>	<p><u>L.O: I can interpret data presented in line graphs</u></p> <p><u>L.O: I can solve problems involving data presented in different formats</u></p> <p><u>L.O: I can recognise and calculate the different parts of a circle (radius and diameter)</u></p> <p><u>L.O: I can interpret data presented in a pie chart</u></p> <p><u>L.O: I can solve problems involving this data</u></p> <p><u>L.O: I can calculate the mean as an average</u></p>	<p>Pie Chart</p> <p>Mean</p> <p>Mode</p> <p>Median</p> <p>Range</p> <p>Statistics</p> <p>Frequency</p> <p>Distribution</p>	<p><u>Assessment task – Area, Perimeter &amp; Volume WRM assessment completed.</u></p> <p><u>Retrieval task</u> – Where might you see a line graph used in real life? Why is the 'Water Consumption' graph more difficult to interpret? How can you make sure that you read the information accurately? What will the <math>\diamond</math>-axis represent? What intervals will you use? What will the <math>\diamond</math>-axis represent? What intervals will you use? How will you make it clear which line represents which set of data? Why is it useful to have both sets of data on one graph?</p> <p><b>REFER TO 6ST-1 ppt</b> Children will build on their experience of interpreting data in context from Year 5, using their knowledge of scales to read information accurately. Examples of graphs are given but it would be useful if real data from across the curriculum e.g. Science, was also used. Chn taught that line graphs represent continuous data not discrete data. They need to read information accurately, including where more than one set of data is on the same graph.</p> <p><b>REFER TO 6ST-2 ppt</b> Children will build on their experience of reading and interpreting data in order to draw their own line graphs. Although example contexts are given, it would be useful if children can see real data from across the curriculum. Children will need to decide on the most appropriate scales and intervals to use depending on the data they are representing.</p> <p><b>EXPAND</b></p>  <p><b>REFER TO 6ST-3 ppt</b> Once children can read, interpret and draw line graphs they need to be able to use line graphs to solve problems. Children need to use their knowledge of scales to read information accurately. They need to be exposed to graphs that show more than one set of data. At this point, children should be secure with the terms <math>\diamond</math> and <math>\diamond</math> axis, frequency and data.</p> <p><b>REFER TO 6ST-4 ppt</b> Children will illustrate and name parts of circles, using the words radius, diameter, centre and circumference confidently. They will also explore the relationship between the radius and the diameter and recognise the diameter is twice the length of the radius.</p> <p><b>REFER TO 6ST-5 ppt</b> Children will build on their understanding of circles to start interpreting pie charts. They will understand how to calculate fractions of amounts to interpret simple pie charts. Children should understand what the whole of the pie chart represents and use this when solving problems.</p> <p><b>REFER TO 6ST-6 ppt</b> Children will apply their understanding of calculating percentages of amounts to interpret pie charts. Children know that the whole of the pie chart totals 100 %. Encourage children to recognise fractions in order to read the pie chart more efficiently.</p> <p><b>CHALLENGE</b></p>  <p><b>REFER TO 6ST-7 ppt</b></p> <p>Children will apply their addition and division skills to calculate the mean average in a variety of contexts. They could find the mean by sharing equally or using the formula: Mean = Total <math>\div</math> number of items. Once children understand how to calculate the mean of a simple set of data, allow children time to investigate missing data when given the mean.</p>