



Maths aims

The national curriculum for Maths aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Intent

At St Peter's Academy, we recognise the importance of maths and our intent is to help children to fulfil their potential and become fluent mathematicians with an appreciation and enjoyment of the skill. With this being our intent, we engage all children in high quality learning experiences in order to foster a passion for maths. This document outlines all that is important to our school in the teaching and learning of our maths curriculum.

Our aim is that all staff teach maths in the most effective way possible through the implementation of the White Rose small steps using the objectives taken from the National Curriculum 2014. This will allow our children to develop confidence, competence and understanding with regards to all fundamental maths skills regardless of gender, ethnicity, educational needs, ethnicity or social and economic background.

- To promote enjoyment and curiosity of learning through practical activity, exploration, investigation, discussion and mastery of skills.
- To understand the importance of mathematics in everyday life.
- Develop children's ability to move between concrete and symbolic representations fluently and confidently.

- To promote confidence and competence with understanding and using numbers and the number system.
- To develop the ability to solve problems through decision making in a range of contexts, and across other curriculum areas.
- To develop a practical understanding of ways in which information is gathered and presented.
- To explore features of shape and space and develop measuring skills in a range of contexts.
- To enable children to select and use a range of mathematical tools effectively.
- To equip children with the mathematical language needed to understand problems and explain their methods and reasoning.
- To promote and provide opportunities for children to develop the core learning skills of confidence, determination, curiosity, aspiration, teamwork, independence, communication and focus.

Implementation

To provide adequate time for developing a range of mathematical concepts, skills and processes, each class teacher teaches a daily lesson. Each lesson will usually be an hour of learning. Every lesson follows the mastery approach which we are further developing this year as part of the Maths Hubs Sustaining Teaching for Mastery programme. Through careful assessment, planning and preparation, we aim to give a range of opportunities including (and not limited to):

- Practical activities and mathematical games
- Use of manipulatives
- Problem solving
- Individual, small group and whole class discussions
- Open and closed tasks
- A range of recording work and calculations

Cross curricular links to maths will be made explicit to the children through topic work.

All maths lessons will be planned for following a sequence of skills using the White Rose scheme of learning with extra challenges added as appropriate.

Curriculum content, planning and resources

We follow White Rose Maths and use resources from this as well as N Rich and I see Maths to further challenge or practice is needed.

Teachers will use the White Rose's calculation policy in order to ensure that there is natural progression and a uniform approach across the school.

Multiplication tables are set as weekly homework using Times Tables Rock Stars as well as being taught in lessons. By the end of Year 4 it is expected that children will be able to recall multiplication and division facts for multiplication tables up to 12 x 12. Years 4 & 5 are delivering the KS2 Mastering number programme which supports the implementation of times tables.

Children will complete their independent maths work in their yellow maths books. In addition to this, fluent in 5 and Flashback 4 questions are used during morning work to support retrieval practice. Any additional support being given will be evident in green pen. Work will be carried out in pencil and equipment such as rulers, protractors, compasses, calculators and measuring equipment will be used appropriately.

Parental links

We maintain links with parents and inform them of their children's progress. We inform them of the school's approach to the teaching of maths through parent sessions, parent evenings and annual written reports. Parents are encouraged to project a positive attitude towards maths to their children and so support for parents is offered and guidance evenings are planned throughout the year. The calculation policies are available to parents via the school website. In addition, a calculation guidance booklet is available on the website which is designed to support parents in supporting their child with the four number operations.

Impact

At St Peter's, we ensure that all children are exposed to rich learning experiences both in and out of the classroom that aims to:

- Allow children to make quick recall of facts and procedures
- Develop a flexibility and fluidity to move between different contexts and representations of mathematics.
- Develop an ability to recognise relationships and make connections in mathematics.
- Overcome the vocabulary deficit by regularly being exposed to a range of mathematical vocabulary and ensuring the understanding of words in context.
- Make the children feel prepared to use their knowledge of key mathematical concepts to contribute to the society around them and the wider world.

A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.

Maths- Year 3 long term plan

	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 term	Number Place value VIEW			Number Addition and subtraction VIEW				Number Multiplication and division A VIEW				
Spring term	Number Multiplication and division B VIEW			Measurement Length and perimeter VIEW		Number Fractions A VIEW		Measurement Mass and capacity VIEW				
Summer term	Number Fractions B VIEW		Measurement Money VIEW	Measurement Time VIEW			Geometry Shape VIEW	Statistics Statistics VIEW		Consolidation		

Amendments to long term plan

Place value- steps 8 (HTO) and 9 (find 1,10,100 +/-) teach after step 4 before completing 5,6,7 which concentrate on 1000s.

Time – teach step 1 (Roman Numerals) after steps 2 & 3.

Maths- Year 4 long term plan 2022/23

	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 term	Number Place value VIEW			Number Addition and subtraction VIEW			Measurement Area VIEW	Number Multiplication and division A VIEW			Consolidation	
Spring term	Number Multiplication and division B VIEW		Measurement Length and perimeter VIEW		Number Fractions VIEW			Number Decimals A VIEW				
Summer term	Number Decimals B VIEW	Measurement Money VIEW	Measurement Time VIEW	Consolidation		Geometry Shape VIEW		Statistics VIEW	Geometry Position and direction VIEW			

Amendments to long term plan

Place value- Teach Roman Numerals at the end of the unit.

Revise fraction of a quantity in the multiplication / division block B as this is not taught in year 4 but reinforces times tables facts.

Maths- Year 5 long term plan

	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 term	Number Place value VIEW			Number Addition and subtraction VIEW		Number Multiplication and division A VIEW		Number Fractions A VIEW				
Spring term	Number Multiplication and division B VIEW			Number Fractions B VIEW		Number Decimals and percentages VIEW		Measurement Perimeter and area VIEW		Statistics VIEW		
Summer term	Geometry Shape VIEW			Geometry Position and direction VIEW		Number Decimals VIEW		Number Negative numbers VIEW	Measurement Converting units VIEW		Measurement Volume VIEW	

Amendments to long term plan

Place value - teach step 1 (Roman Numerals) at the end of the unit.

Perimeter / area – teach step 6 (estimate area) first before finding the area of shapes step 4 & 5.

Decimals – teach steps 4 then 6, 5 then 7 to keep +/- together rather than swapping between them.

Swap around negative numbers unit with converting units as at the end of decimals unit it uses $\times/\div 10, 100, 1000$ which is essential to the converting unit.

Maths- Year 6 long term plan

	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 term	Number Place value VIEW		Number Addition, subtraction, multiplication and division VIEW				Number Fractions A VIEW		Number Fractions B VIEW		Measurement Converting units VIEW	
Spring term	Number Ratio VIEW		Number Algebra VIEW		Number Decimals VIEW		Number Fractions decimals and percentages VIEW		Measurement Area, perimeter and volume VIEW		Statistics VIEW	
Summer term	Geometry Shape VIEW		Geometry Position and direction VIEW		Themed projects, consolidation and problem solving							

Amendments to long term plan

Decimals- teach step 5 & 6 ($\times/\div 10, 100, 1000$) in the Autumn before teaching the converting measures unit. This is a vital skill when converting measures.

Subject: Maths Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Colours: red, blue, yellow, green, purple, mix of colours Match: buttons and colours, towers, shoes, number shapes, shapes, pattern handprints – big and small Sort: colour, size, shape What do you notice? Guess the rule	Number 1: subitising, counting, numeral Number 2: Subitising, dice pattern, random pattern, counting, numeral Subitising – different sizes Patterns: Extend AB colours, extend AB outdoor, AB movement, fix my pattern, extend ABC colours, extend ABC outdoor patterns	Number 3: subitising, 3 Little pigs, 1:1 counting, numerals, triangles Number 4: 1:1 counting, numerals, squares, rectangles, Composition of 4 Number 5: 1:1 counting, numerals, pentagon, composition of 5	Number 6 Introduce 10 frame Height & Length: tall and short, long and short, mass Relate to books: 3 little pigs, goldilocks Capacity	More than/fewer than One more One less Shape – 2D Revisit pattern from Autumn Positional Language Shape – 3D	Number composition 1 – 5 Revision Night and Day Order events in their day at nursery What happens day/night
Reception Mastering Number only	subitising and counting skills, composition of numbers within 5, compare sets of objects and use the language of comparison Space and shapes, measures and patterns (see appendix)		subitising and counting skills, composition of numbers within and beyond 5, identify when two sets are equal or unequal and connect two equal groups to doubles, connect quantities to numerals.		count to larger numbers and develop a wider range of counting strategies and number facts through varied practice Space and shapes, measures and patterns	
Year 1	Place Value (within 10) Addition and Subtraction (within 10)	Addition and Subtraction (within 10) Shape	Place Value (within 20) Addition and Subtraction (within 20)	Place Value (within 50) Length and Height; Weight and Volume	Multiplication and Division Fractions Position and direction	Place value (within 100) Money Time
Year 2	Place value Addition and Subtraction	Addition and subtraction Properties of Shape	Money Multiplication and Division	Length and Height, Mass, Capacity and Temperature	Fractions Time Statistics	Position and Direction
Year 3	Place Value Addition and Subtraction	Addition and Subtraction Multiplication and Division	Multiplication and Division Length and Perimeter	Fractions Mass and Capacity	Fractions Money Time	Time Properties of Shape Statistics
Year 4	Place Value Addition and Subtraction	Addition and Subtraction Area Multiplication and Division	Multiplication and Division Length and Perimeter Fractions	Fractions Decimals	Decimals Money Time	Properties of Shape Statistics Position and Direction
Year 5	Place Value Addition and Subtraction Multiplication and Division	Multiplication and Division Fractions	Multiplication and Division Fractions Decimals and Percentages	Decimals and Percentages Perimeter and Area Statistics	Properties of Shape Position and Direction Decimals	Decimals Negative numbers Converting Units Volume
Year 6	Place Value Addition, Subtraction, Multiplication and Division	Addition, Subtraction, Multiplication and Division Fractions Converting Units	Ratio Algebra Decimals	Fractions, decimals and Percentages Perimeter, Area and Volume Statistics	Properties of Shape Position and Direction	Consolidation

Key: Number, Measurements, Geometry, Statistics

Place Value

Year 1	Unit Title: Place Value (Autumn block 1, Autumn block 4, Spring block 2, Summer block 4)
NC Objectives:	
<p>Counting</p> <ul style="list-style-type: none"> count to and across 100, forwards and backward, beginning with 0 or 1, or from any given number count numbers to 100 in numerals; count in multiples of twos, fives and tens <p>Represent</p> <ul style="list-style-type: none"> identify and represent numbers using objects and pictorial representations including the number line, read and write numbers to 100 in numerals read and write numbers from 1 to 20 in numerals and words <p>Use Place Value and Compare</p> <ul style="list-style-type: none"> Given a number, identify one more and one less 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> count reliably with numbers from 1 to 5 compare objects, up to 5, in two groups, including identical and non-identical objects use the language of more than, fewer than, equal to and the same as count reliably with numbers from 1 to 10 compare objects, up to 10, in two groups, including identical and non-identical objects use the language of more than, fewer than, equal to and the same as count reliably with numbers from 1 to 20 place numbers 1 – 20 in order 	<ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward recognise the place value of each digit in a two-digit number (tens, ones) identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100 use <, > and = signs read and write numbers to at least 100 in numerals and in words use place value and number facts to solve problems
Key Knowledge and Common Misconceptions	Vocabulary
Please see the White Rose 'Scheme of Learning' for this area.	Above - Something that is over another number. Backwards - Back towards the starting point.

<p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Below - Something that is lower than something else. Equal to - Being the same in quantity Equivalent to - Equal in value, amount Forwards To - advance something Half-way between - 1 at or to half the distance Known fact - A number fact which has been committed to memory (or very fast recall) and can be applied fluently to various calculation strategies. Least - Smallest in amount Many - A number representing some quantity. Most - Largest in amount. Multiple of - A number that may be divided by another a certain number of times without a remainder. Numeral - A symbol or name that stands for a number. Numbers 20-100 Rule - A consistent pattern which allows generalisation. Awareness of a rule allows a pupil to continue a sequence or generate a related sequence.</p>
---	--

Year 2	Unit Title: Place Value (Autumn block 1)
NC Objectives:	
<p>Counting</p> <ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward <p>Represent</p> <ul style="list-style-type: none"> read and write numbers to 100 in numerals and words identify, represent and estimate numbers using different representations, including the number line <p>Use Place Value and Compare</p> <ul style="list-style-type: none"> recognise the place value of each digit in a two-digit number (tens, ones) compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs <p>Problem and Rounding</p> <ul style="list-style-type: none"> use place value and number facts to solve problems 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> use the language of more than, fewer than, equal to and the same as count to and across 100, forwards and backward, beginning with 0 or 1, or from any given number count numbers to 100 in numerals; count in multiples of twos, fives and tens 	<ul style="list-style-type: none"> count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

- | | |
|---|--|
| <ul style="list-style-type: none"> • identify and represent numbers using objects and pictorial representations including the number line, • read and write numbers to 100 in numerals • read and write numbers from 1 to 20 in numerals and words • Given a number, identify one more and one less | <ul style="list-style-type: none"> • compare and order numbers up to 1000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas |
|---|--|

Key Knowledge and Common Misconceptions	Vocabulary
--	-------------------

<p>Please see the White Rose 'Scheme of Learning' for this area.</p> <p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'. You will also find key questions and possible sentence stems here.</p>	<p>Calculate - To compute or work out mathematically. Column - A vertical arrangement of numbers or objects. Continue - To carry something on. Efficient - Well-organised. > Greater than - The > symbol means "greater than". It shows that one number or value is larger than another number. Hundreds - The number equivalent to the product of ten and ten; ten more than ninety; a three-digit number. < Less than - The symbol < means that one number is smaller than the other number. One-, two- or threedigit number - One-digit numbers are the numbers 0-9; two-digit numbers are the numbers 10 to 99; threedigit numbers are the numbers 100 to 999 Operation - A mathematical process. The four mathematical operations are addition, subtraction, multiplication and division. Place value - A system for writing numbers, in which the value of a digit is defined by its position within the number. Predict - A prediction is a reasonable guess as to what will happen. Representation - A very general relationship that expresses similarities (or equivalences) between mathematical objects or structures. Rule - Rule is the procedure that a count must follow. Sequence - A list of numbers or objects in a special order. Twenty-first, twenty-second... ninety ninth, one-hundredth'. Twenty-one, twentytwo...</p>
---	--

Year 3	Unit Title: Place Value (Autumn block 1 and 3)
---------------	---

NC Objectives:

<p>Counting</p> <ul style="list-style-type: none"> • count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number <p>Represent</p>

- identify, represent and estimate numbers using different representations
- read and write numbers up to 1000 in numerals and in words

Use Place Value and Compare

- recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
- compare and order numbers up to 1000

Problem and Rounding

- solve number problems and practical problems involving these ideas

Previous Learning

- Given a number, identify one more and one less count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones) identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100
- use $<$, $>$ and $=$ signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems

Future Learning

- 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 and place value

Key Knowledge and Common Misconceptions

Please see the White Rose 'Scheme of Learning' for this area.

Key Knowledge can be found under the heading 'Notes and Guidance'.
Misconceptions can be found under the heading 'Things to look out for'
You will also find key questions and possible sentence stems here.

Vocabulary

Approximate - Anything that is similar, but not exactly equal, to something else.
Formal written method - A way of carrying out a calculation which is done on paper rather than entirely mentally.
Numbers 101- 1,000
Place holder - A place holder is a zero used in any place value column (that contains a value of zero) to clarify the relative positions of the digits in other places.
Relationship - A mathematical relation is, a relationship between sets of numbers or sets of element.
Round - Approximate a number, normally to the nearest multiple of ten, to make it easier with which to calculate.

Year 4	Unit Title: Place Value (Autumn block 1 and 4)
NC Objectives:	
<p>Counting</p> <ul style="list-style-type: none"> count in multiples of 6, 7, 9, 25 and 1000 count backwards through zero to include negative numbers <p>Represent</p> <ul style="list-style-type: none"> identify, represent and estimate numbers using different representations 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 <p>Use Place Value and Compare</p> <ul style="list-style-type: none"> find 1000 more or less than a given number recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000 <p>Problem and Rounding</p> <ul style="list-style-type: none"> 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 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number recognise the place value of each digit in a three-digit number (hundreds, tens, ones) compare and order numbers up to 1000 identify, represent and estimate numbers using different representations read and write numbers up to 1000 in numerals and in words solve number problems and practical problems involving these ideas 	<ul style="list-style-type: none"> read, write, order and compare numbers to at least 1 000 000 determine the value of each digit of numbers up to 1 000 000 count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 solve number problems and practical problems that involve all of the above read Roman numerals to 1000 (D & M) and recognise years written in Roman numerals
Key Knowledge and Common Misconceptions	Vocabulary
Please see the White Rose 'Scheme of Learning' for this area.	Consecutive - Following each other continuously

<p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'. You will also find key questions and possible sentence stems here.</p>	<p>Expression - One or a group of numbers, symbols or operators. An expression does not use equality or inequality signs. Using an equality or inequality sign will give an equation. Integer - A whole number that can be positive or negative. Negative numbers - A number that is less than zero. Positive number - A number that is greater than zero. Zero is neither positive or negative. Thousand, ten thousand, hundred thousand, million</p>
--	--

Year 5	Unit Title: Place Value (Autumn block 1)
NC Objectives:	
<p>Counting</p> <ul style="list-style-type: none"> count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 count forwards and backwards with positive and negative whole numbers, including through zero <p>Represent</p> <ul style="list-style-type: none"> read, write, order and compare numbers to at least 1 000 000 read Roman numerals to 1000 (D & M) and recognise years written in Roman numerals <p>Use Place Value and Compare</p> <ul style="list-style-type: none"> read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit <p>Problem and Rounding</p> <ul style="list-style-type: none"> interpret negative numbers in context, round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 solve number problems and practical problems that involve all of the above 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> read, write, order and compare numbers up to 10 000 000 determine the value of each digit up to 10 000 000 round any whole number to a required degree of accuracy use negative numbers in context, and calculate intervals across zero solve number and practical problems that involve all of the above backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals

<ul style="list-style-type: none"> • 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 <p>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</p>	
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area.</p> <p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Ascending order - Arranged from smallest to largest. Increasing. Descending order - Arranged from largest to smallest. Decreasing. ≥ Greater than or equal to - Something is either greater than or equal to another thing. ≤ Less than or equal to - Something is either less than or equal to another thing.</p>

Year 6	Unit Title: Place Value (Autumn block 1)
NC Objectives:	
<p>Counting</p> <p>Represent</p> <ul style="list-style-type: none"> • read, write, order and compare numbers up to 10 000 000 • determine the value of each digit up to 10 000 000 <p>Use Place Value and Compare</p> <ul style="list-style-type: none"> • read, write, order and compare numbers up to 10 000 000 • determine the value of each digit up to 10 000 000 <p>Problem and Rounding</p> <ul style="list-style-type: none"> • round any whole number to a required degree of accuracy • use negative numbers in context, and calculate intervals across zero • solve number and practical problems that involve all of the above backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • count forwards and backwards with positive and negative whole numbers, including through zero • read, write, order and compare numbers to at least 1 000 000 	<ul style="list-style-type: none"> • Key Stage Three

<ul style="list-style-type: none"> • read Roman numerals to 1000 (D & M) and recognise years written in Roman numerals • read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • interpret negative numbers in context, • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above 	
<p>Key Knowledge and Common Misconceptions</p>	<p>Vocabulary</p>
<p>Please see the White Rose 'Scheme of Learning' for this area.</p> <p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Brackets - The symbols () used to separate parts of a multi-step calculation.</p> <p>Degree of accuracy - A description of how accurately a value is communicated.</p> <p>Equivalent expression - An expression, which can be algebraic, which is equal in value to another expression.</p> <p>Order of operations - The internationally agreed order to complete operations in a multi-step equation with multiple operations.</p>

Calculations

Year 1	Unit Title: Calculations (Autumn block 2, Spring block 1, Summer block 1)	
NC Objectives:		
<p>Addition and Subtraction</p> <ul style="list-style-type: none"> • 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 $7 = \square - 9$. <p>Multiplication and Division</p> <ul style="list-style-type: none"> • 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. 		
Previous Learning	Future Learning	
<ul style="list-style-type: none"> • combining two amounts • making pairs • composition of 4 and 5 • adding more on • taking away • sharing and grouping • doubling 	<ul style="list-style-type: none"> • 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 • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs 	

	<ul style="list-style-type: none"> • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area.</p> <p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'</p> <p>You will also find key questions and possible sentence stems here.</p>	<p>Addend - The numbers or terms added together to form the sum.</p> <p>Difference - The numerical difference between two numbers or sets of objects.</p> <p>Equals - Be the same as in number or amount.</p> <p>Half - Either of two equal or corresponding parts into which something is or can be divided.</p> <p>Minuend - A quantity or number from which another is to be subtracted.</p> <p>Missing number - A part of an equation that is missing.</p> <p>Near Close to - '9 is close to 10'.</p> <p>Number bonds/pairs - A pair of numbers with a given total.</p> <p>Repeated addition - A structure of multiplication where equal parts are added to make a whole.</p> <p>Repeated subtraction - A structure of division, where equal parts are subtracted and the number of equal parts summed to calculate a quotient.</p> <p>Subtract - Carry out the process of subtraction.</p> <p>Subtrahend - A quantity or number to be subtracted from another.</p> <p>Array - An arrangement of counters or numbers, in columns and rows, used to represent multiplication and division.</p> <p>Divide - To share or group into equal parts.</p> <p>Dividend - A number to be divided by another number.</p> <p>Division - Distributing a group of things into equal parts.</p> <p>Divisor - A divisor is a number that divides another number either completely or with a remainder.</p> <p>Grouping - Dividing things into equal groups or sets. This is one model for division.</p> <p>Multiplication - Gives the result of combining groups of equal sizes.</p> <p>Multiple - The product result of one number multiplied by another number.</p> <p>Multiplicand - A quantity which is to be multiplied by another (the multiplier).</p> <p>Multiplier - A quantity that multiplies the multiplicand.</p> <p>Multiply - Add equal groups.</p> <p>Product - The result of one or more multiplications</p> <p>Quotient - A result obtained by dividing one quantity by another.</p> <p>Sharing - To distribute fairly between a given number of recipients. This is one model for division.</p>

NC Objectives:

Addition and Subtraction

- use concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Multiplication and Division

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Previous Learning

- 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 $7 = - 9$.
- 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.

Future Learning

- add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds,
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Key Knowledge and Common Misconceptions

Please see the White Rose 'Scheme of Learning' for this area.
Key Knowledge can be found under the heading 'Notes and Guidance'.
Misconceptions can be found under the heading 'Things to look out for'

Vocabulary

Facts - A fact family can be defined as a group of math facts or equations created using the same set of numbers.
Inverse operations - Opposite operations that 'undo' each other.
Near double - When two numbers involved in an addition are close in value,

<p>You will also find key questions and possible sentence stems here.</p>	<p>such as $23 + 22$. The numbers can be treated as exact doubles, followed by compensating.</p> <p>Regroup - To rearrange groups in place value to carry out an operation.</p> <p>Renaming - Writing a number in an equivalent form, usually in terms of its place-value parts.</p> <p>Division fact - Division number sentences related to times tables knowledge.</p> <p>Equal groups of - A group is an equal group if it has the same number of items as all of the other groups.</p> <p>Left over - When dividing in maths, the groups can be the same size. Sometimes there may be a leftover.</p> <p>Multiplication fact - The answer to a multiplication calculation.</p> <p>Multiplication table - A list that shows the results of multiplying certain numbers by each other.</p> <p>Times - An arithmetic operation that is the inverse of division.</p>
---	---

Year 3	Unit Title: Calculation (Autumn block 1 & 2, Spring block)
---------------	---

NC Objectives:	
-----------------------	--

Addition and Subtraction

- add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds,
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Multiplication and Division

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Previous Learning	Future Learning
--------------------------	------------------------

<ul style="list-style-type: none"> • use concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers 	<ul style="list-style-type: none"> • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. • recall multiplication and division facts for multiplication tables up to 12×12
---	--

<ul style="list-style-type: none"> • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. • 	<ul style="list-style-type: none"> • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.
--	--

Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Columnar addition/subtraction - The formal written algorithms for addition and subtraction that are exemplified in Mathematics Factor - A number, that when multiplied with one or more other factors, makes a given number. Product - The result you get when you multiply two numbers.</p>

Year 4	Unit Title: Calculations (Autumn block 1 & 2, Spring block 1)
NC Objectives:	
<p>Addition and Subtraction</p> <ul style="list-style-type: none"> • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. <p>Multiplication and Division</p> <ul style="list-style-type: none"> • recall multiplication and division facts for multiplication tables up to 12×12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. 	

Previous Learning	Future Learning
<ul style="list-style-type: none"> • add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds, • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. • recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. 	<ul style="list-style-type: none"> • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • recognise and use square numbers and cube numbers, and the notation for squared and cubed • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Associative law - No matter how the parts in an addition or multiplication equation are grouped, the answer will be the same. Distributive law - The process whereby adding some numbers and then multiplying the sum gives the same answer as multiplying the numbers separately and then adding the products. Short division - A formal written layout where the quotient is calculated showing only one written step. Short multiplication - A formal written layout where the multiplier is usually 9 or less.</p>

Year 5	Unit Title: Calculations (Autumn block 1 & 2, Spring block 1)
NC Objectives:	
<p>Addition and Subtraction</p> <ul style="list-style-type: none"> • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. <p>Multiplication and Division</p> <ul style="list-style-type: none"> • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • recognise and use square numbers and cube numbers, and the notation for squared and cubed • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. • recall multiplication and division facts for multiplication tables up to 12×12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. 	<ul style="list-style-type: none"> • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • perform mental calculations, including with mixed operations and large numbers • identify common factors, common multiples and prime numbers • use their knowledge of the order of operations to carry out calculations involving the four operations • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why solve problems involving addition, subtraction, multiplication and division

	<ul style="list-style-type: none"> use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'. You will also find key questions and possible sentence stems here.</p>	<p>Common factor - A factor of two (or more) given numbers. Common multiple - A multiple of two (or more) given numbers. Cube number - The result of multiplying a whole number by itself twice. Divisible - A number is said to be divisible by another if it can be divided by that number without a remainder. Factor pair - A factor pair is a pair of numbers that, when multiplied will result in a given product. Long division - The formal written algorithm that can be used to divide by a number with two or more digits. Long multiplication - The formal written algorithm that can be used to multiply a number by a number with two or more digits. Prime factor - A factor that is a prime number. Prime number - A whole number with only two factors, one and the number itself. Square number - The product of two equal factors.</p>

Year 6	Unit Title: Calculations (Autumn block 1)
NC Objectives:	
<ul style="list-style-type: none"> multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers use their knowledge of the order of operations to carry out calculations involving the four operations solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) add and subtract numbers mentally with increasingly large numbers use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy 	<ul style="list-style-type: none"> Key Stage Three

- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared and cubed
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Key Knowledge and Common Misconceptions

Please see the White Rose 'Scheme of Learning' for this area.
 Key Knowledge can be found under the heading 'Notes and Guidance'.
 Misconceptions can be found under the heading 'Things to look out for'
 You will also find key questions and possible sentence stems here.

Vocabulary

Factorise - To identify factors of a given number. To express a number as factors.
 Prime factor - A factor that is a prime number.

Fractions

Year 1	Unit Title: Fractions (Summer block 1)
NC Objectives:	
Fractions <ul style="list-style-type: none"> recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> halving numbers 	<ul style="list-style-type: none"> recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity write simple fractions for example, $\frac{1}{2}$ of $6 = 3$ and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	Equal grouping - Groups that have the same number of equivalent items. Equal part - Having the same portion, division, piece, or segment of a whole. Equal sharing - Dividing the whole or a group of objects is into equal parts. How many parts of a whole: <ul style="list-style-type: none"> the top number (the numerator) says how many parts we have. the bottom number (the denominator) says how many equal parts the whole is divided into. One of two equal parts When something is divided into two equal sections, half is one of the two parts. Quarter - One of four equal parts of a whole, quantity or object.
Year 2	Unit Title: Fractions (Summer block 1)
NC Objectives:	

Fractions

- recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

Previous Learning

- recognise, find and name a half as one of two equal parts of an object, shape or quantity
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

Future Learning

- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

Key Knowledge and Common Misconceptions

Please see the White Rose 'Scheme of Learning' for this area.
Key Knowledge can be found under the heading 'Notes and Guidance'.
Misconceptions can be found under the heading 'Things to look out for'
You will also find key questions and possible sentence stems here.

Vocabulary

Denominator - The number written below the vinculum in a fraction. In a measure context, it indicates the number of equal parts into which the whole is divided. In a division context, it is the divisor.

Equivalence - The condition of being equal or equivalent in value, worth.

Mixed number - A number consisting of an integer and a proper fraction.

Non-unit fraction - A fraction with a numerator greater than one.

Numerator - The number written above the vinculum in a fraction. In a measure context, it indicates the specified number of parts out of the whole. In a division context, it is the dividend.

One of three equal parts - When a shape is divided into three equal parts, each part is called a third.

One third, two thirds - When a shape is divided into three equal parts, each part is called a third. Two of these parts are called two thirds.

Two halves - Two equal parts of one whole thing.

Two quarters, three quarters - When a shape is divided into four equal parts, each part is called a quarter. Two of these parts are called two quarters. Three of these parts is called three quarters.

Unit fraction - A fraction with a numerator of one.

Vinculum - A horizontal line that separates the numerator and the denominator in a fraction.

Year 3	Unit Title: Fractions (Spring block 2, Summer block 1)
NC Objectives:	
<p>Fractions</p> <ul style="list-style-type: none"> • count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ 	<ul style="list-style-type: none"> • 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 number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Sixths, sevenths, eighths, tenths</p>

Year 4	Unit Title: Fractions and Decimals (Spring block 2, Summer block 1)
NC Objectives:	
<p>Fractions</p> <ul style="list-style-type: none"> • 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 number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above. 	<ul style="list-style-type: none"> • compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number • add and subtract fractions with the same denominator and denominators that are multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents and those fractions with a denominator of a multiple of 10 or 25.

Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Decimal equivalent - Two decimal numbers that are equivalent, that is, they represent the same value or amount. Decimal fraction - A fraction expressed in its decimal form. Decimal place - The position of a digit to the right of a decimal point. Decimal point - A full point or dot placed after the figure representing units in a decimal fraction. Hundredths - Each of one hundred equal parts into which something is or may be divided. Mixed number - Numbers consisting of an integer and fractional part. Proper fraction - A fraction with a value less than one. Proportion - Harmonious relation of parts to each other or to the whole. Simplify - To write a number or equation in its simplest form.</p>

Year 5	Unit Title: Fractions etc. (Autumn block 2, Spring block 1 & 2, Summer block 1 & 2)
NC Objectives:	
<p>Fractions and Decimals</p> <ul style="list-style-type: none"> • compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number • add and subtract fractions with the same denominator and denominators that are multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • read and write decimal numbers as fractions [for example, $0.71 = 71/100$] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents and those fractions with a denominator of a multiple of 10 or 25. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

<ul style="list-style-type: none"> • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places. 	<ul style="list-style-type: none"> • multiply simple pairs of proper fractions, writing the answer in its simplest form • divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places multiply one-digit numbers with up to two decimal places by whole numbers • use written division methods in cases where the answer has up to two decimal places • solve problems which require answers to be rounded to specified degrees of accuracy • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. • use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables.
--	--

Key Knowledge and Common Misconceptions	Vocabulary
--	-------------------

<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Percentage - The number of parts per hundred which is written using the % symbol. Thousandths - The third decimal digit from the decimal point is the thousandths digit.</p>
--	--

Year 6	Unit Title: Fractions etc and Ratio (Autumn block 2, Spring block 1 & 2)
---------------	---

NC Objectives:

Fraction, decimals and percentages

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

Ratio and Proportion

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

Algebra

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

Previous Learning

- compare and order fractions whose denominators are all multiples of the same number
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example, $0.71 = 71/100$]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place

Future Learning

- **Key Stage Three**

<ul style="list-style-type: none"> • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents and those fractions with a denominator of a multiple of 10 or 25 	
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Ratio - A ratio shows the relative sizes of two or more values. Proportion - A comparison between two or more parts of a whole or group. Proportion expresses a part-whole relationship. This may be represented as a fraction, a percentage or a decimal. Equation - An equation says that two things are equal. It will have an equals "=" sign Formula - An algebraic expression of a rule. Unknown - A number we do not know but can be calculated. Variable - A symbol for a value we don't know yet. It is usually a letter like x or y.</p>

Measurements

Year 1	Unit Title: Measurements (Spring block 2, Summer block 2)
NC Objectives:	
<ul style="list-style-type: none"> • compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] • 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]
- time [for example, quicker, slower, earlier, later]
- measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time (hours, minutes, seconds)
- recognise and know the value of different denominations of coins and notes
- sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
- recognise and use language relating to dates, including days of the week, weeks, months and years
- tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

Previous Learning	Future Learning
-------------------	-----------------

<ul style="list-style-type: none"> • key times of day • class routines • compare sizes, mass and capacity • introduction to length and height 	<ul style="list-style-type: none"> • 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 • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day.
---	--

Key Knowledge and Common Misconceptions	Vocabulary
---	------------

<p>Please see the White Rose 'Scheme of Learning' for this area.</p> <p>Key Knowledge can be found under the heading 'Notes and Guidance'.</p> <p>Misconceptions can be found under the heading 'Things to look out for'</p> <p>You will also find key questions and possible sentence stems here.</p>	<p>Metre - A standard unit of measure, equal to 100 centimetres.</p> <p>Metre stick - A measuring stick one meter long that is marked off in centimeters and usually millimeters.</p> <p>Ruler - A tool or device used to measure length and draw straight lines.</p> <p>Kilogram - A standard unit of mass, equal to 1000 grams.</p> <p>Capacity - The maximum amount that something can contain.</p> <p>Less than - One value or amount is lesser than the other.</p> <p>Litre - A standard unit of volume, equal to 1000 millilitres.</p> <p>More than - One value or amount is greater than the other.</p> <p>Volume - A quantity or amount of any substance and the 3-D space it fills.</p> <p>Always - At all times.</p> <p>Analogue clock - A clock with a face and hands.</p> <p>Date - The day of the month or year as specified by a number.</p> <p>Earlier - Before the usual or expected time.</p> <p>Half past, Hour hand, Later, Midnight, Minute hand, Minute, Months of the year, Never, Often, Once, Quarter past, Quarter to, Seasons 'Spring, summer, autumn, winter', Sometimes, Twice, Usually, Weekend</p> <p>Year - The period of 365 days (or 366 days in leap years) starting from the first of January</p> <p>Change - Receiving money back after purchasing.</p> <p>Cheap - Low in price, especially in relation to similar items or services.</p>
--	---

Costs less - Cheaper in one place than in another.
 Costs more - More expensive in one place than in another.
 Dear - Very expensive.
 Total - Comprising the whole number or amount.

Year 2	Unit Title: Measurements (Spring block 2, Summer block 1)
NC Objectives:	
<ul style="list-style-type: none"> 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 compare and order lengths, mass, volume/capacity and record the results using >, < and = recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change compare and sequence intervals of time tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times know the number of minutes in an hour and the number of hours in a day. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] 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] time [for example, quicker, slower, earlier, later] measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time (hours, minutes, seconds) recognise and know the value of different denominations of coins and notes sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] recognise and use language relating to dates, including days of the week, weeks, months and years tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. 	<ul style="list-style-type: none"> measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) measure the perimeter of simple 2-D shapes add and subtract amounts of money to give change, using both £ and p in practical contexts tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight know the number of seconds in a minute and the number of days in each month, year and leap year compare durations of events [for example to calculate the time taken by particular events or tasks].
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'</p>	<p>Centimetre - A measure of length. It is about the width of a fingernail. There are 100 centimetres in a metre. The abbreviation is cm. Furthest - At or by the greatest distance.</p>

<p>You will also find key questions and possible sentence stems here.</p>	<p>Tape Measure - A length of tape or thin flexible metal, marked at graded intervals for measuring. Gram - A metric unit of mass equal to one thousandth of a kilogram. Millilitre - One thousandth of a litre. Degree - A set change in temperature measured against a given scale Temperature - Measure of hotness or coldness. ' 5, 10, 15 ... minutes past Digital clock - A clock that displays the time in numerical digits rather than by hands on a dial. Fortnight - A period of two weeks. 'There are 14 days in a fortnight'. Seconds - A unit of time.</p>
---	---

<p>Year 3</p>	<p>Unit Title: Measurements (Spring block 1 & 2, Summer block 1)</p>
<p>NC Objectives:</p>	
<ul style="list-style-type: none"> • measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes • add and subtract amounts of money to give change, using both £ and p in practical contexts • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events [for example to calculate the time taken by particular events or tasks]. 	
<p>Previous Learning</p>	<p>Future Learning</p>
<ul style="list-style-type: none"> • 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 • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day. 	<ul style="list-style-type: none"> • 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 • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence

Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Distance from/to - How far away something is. Kilometre - A metric unit measure of length that is equal to one thousand metres. Millimetre - A metric unit measure of length that is equal to one thousandth of one metre. Perimeter - The perimeter of a 2-D shape is the total distance around its exterior. Centigrade - The Celsius scale of temperature. 12-hour clock time - The 12-hour clock notation uses am and pm to indicate morning and afternoon. 24-hour clock time - A way of telling the time in which the day runs from midnight to midnight and is divided into 24 hours, numbered from 0 to 24. Calendar - A chart or series of pages showing the days, weeks, and months of a particular year, or giving particular seasonal information. Century - A period of 100 years. Earliest - Happening or done before the usual or expected time. Latest - Of most recent date. PM - The abbreviation p.m. stand for the Latin post meridiem, meaning after midday. Roman numerals - Roman numerals are a system of symbols used to represent numbers that were developed and used by the Romans. They do not use a place value system.</p>

Year 4	Unit Title: Measurements (Autumn block 2 , Spring block 1, Summer block 1)
NC Objectives:	
<ul style="list-style-type: none"> • 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 • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes • add and subtract amounts of money to give change, using both £ and p in practical contexts • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks 	<ul style="list-style-type: none"> • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres

<ul style="list-style-type: none"> estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight know the number of seconds in a minute and the number of days in each month, year and leap year compare durations of events [for example to calculate the time taken by particular events or tasks]. 	<ul style="list-style-type: none"> calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] solve problems involving converting between units of time use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.
--	--

Key Knowledge and Common Misconceptions	Vocabulary
--	-------------------

<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Area - The space a surface takes up inside its perimeter. Area is always measured in square units. Breadth - The distance or measurement from side to side of something Convert - To change from one unit of measurement to another. Square centimetre - A unit of measure for area equal to a square with the dimensions 1cm by 1cm. Mass - Mass is commonly measured by how much something weighs. Weight - Weight is the measure of how heavy an object is. Measuring cylinder - Measuring cylinders are for holding and measuring varying amounts of liquids. Arrive - Reach a place at the end of a journey or a stage in a journey. Depart - Leave, especially in order to start a journey. Leap year - A year, occurring once every four years, which has 366 days including 29 February as an extra day. Millennium - A period of 1,000 years. Noon - Twelve O'clock in the day. Midday. Timetable - A chart showing the departure and arrival times of trains, buses, or aircraft.</p>
--	--

Year 5	Unit Title: Measurements (Spring block 2, Summer block 2)
---------------	--

NC Objectives:	
-----------------------	--

<ul style="list-style-type: none"> convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]
--

<ul style="list-style-type: none"> • solve problems involving converting between units of time • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • 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 • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence 	<ul style="list-style-type: none"> • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Imperial unit - A system of measurement in use in the United Kingdom now mostly superseded by the metric system. Inches - A measure of length. Scale - The ratio of lengths, in a drawing, are in proportion to the measurements of the real object. The lengths are not in proportion when not to scale. Square millimetre (mm²) - The area equal to a square that is 1mm on each side. Square metre (m²) - The area equal to a square that is 1m on each side. Pounds - A measure of mass in the Imperial measurement systems. Cubic centimetre - A unit used to measure volume. The space taken up by a cube with edges of length 1 cm or which measures 1 cm × 1 cm × 1 cm. Cubic metre - A unit used to measure volume. The space taken up by a cube with edges of length 1 metre. Pint - A measure of volume in the Imperial systems of measurement. Currency - A system of money in general use in a particular country. Discount - A reduction in price.</p>

NC Objectives:	
<ul style="list-style-type: none"> • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes • estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] • solve problems involving converting between units of time • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. 	<ul style="list-style-type: none"> • Key Stage Three
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Feet/foot - An imperial unit of measure of length. Mile - An imperial unit of measure of length. Yard - A unit of length (or distance) equal to 3 feet or 36 inches. Ounce - An imperial unit of measure of mass. Tonne - A unit of mass equal to 1000 kilograms. Centilitre - A metric unit of capacity, equal to one hundredth of a litre Gallon - An imperial unit of measure of volume/capacity. British Summer Time - Time as advanced one hour ahead of Greenwich Mean Time for daylight saving in the UK between March and October. Greenwich Mean Time - Greenwich Mean Time is an internationally standard time format. It is the main time zone in several countries, including the United Kingdom. Loss - If the income is less than the expenses. Profit - Income minus all expenses.</p>

Geometry

Year 1	Unit Title: Geometry (Autumn block 2, Summer block 1)
NC Objectives:	
<p>Properties of Shapes</p> <ul style="list-style-type: none"> recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] and 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. <p>Position and Direction</p> <ul style="list-style-type: none"> describe position, direction and movement, including whole, half, quarter and three-quarter turns. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> exploring patterns positional language circles and triangles shapes with 4 sides 3D shapes Visualising and building Matching, rotating and manipulating 	<p>Properties of shapes</p> <ul style="list-style-type: none"> identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] compare and sort common 2-D and 3-D shapes and everyday objects. <p>Position and direction</p> <ul style="list-style-type: none"> order and arrange combinations of mathematical objects in patterns and sequences use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).
Key Knowledge and Common Misconceptions	Vocabulary
Please see the White Rose 'Scheme of Learning' for this area.	<p>Oblong - A quadrilateral with two pairs of parallel sides of equal length.</p> <p>Point - A sharp point of a shape.</p>

<p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'. You will also find key questions and possible sentence stems here.</p>	<p>3d shape - Volume A quantity or amount of any substance and the 3-D space it fills. Position and direction - Anti-clockwise Movement in the opposite direction to the motion of the hands of a clock. Center - A center is a point that is the same distance from all the extremities of a figure. Clockwise - Movement in the direction of the hands of a clock. Quarter turn - A 90-degree rotation, i.e. $\frac{1}{4}$ of a 360 degree 'full' turn. Three-quarter turn - A 270-degree rotation i.e. $\frac{3}{4}$ of a 360 degree 'full' turn.</p>
--	---

Year 2	Unit Title: Geometry (Autumn block 2, Summer block 2)
---------------	--

NC Objectives:

<p>Properties of shapes</p> <ul style="list-style-type: none"> • identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D and 3-D shapes and everyday objects. <p>Position and direction</p> <ul style="list-style-type: none"> • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).
--

Previous Learning	Future Learning
--------------------------	------------------------

<p>Properties of Shapes</p> <ul style="list-style-type: none"> • recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] and 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. <p>Position and Direction</p> <ul style="list-style-type: none"> • describe position, direction and movement, including whole, half, quarter and three-quarter turns. 	<p>Properties of Shapes</p> <ul style="list-style-type: none"> • draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • recognise angles as a property of shape or a description of a turn • identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle • identify horizontal and vertical lines and pairs of perpendicular and parallel lines.
--	--

Key Knowledge and Common Misconceptions	Vocabulary
--	-------------------

<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'. You will also find key questions and possible sentence stems here.</p>	<p>Hexagon - A polygon with six sides and six angles. Line symmetry - A shape is symmetrical when it fits exactly onto itself when folded in half. Octagon - A polygon with eight sides and eight angles. Pentagon - A polygon with five sides and five angles. Surface - The outside part or uppermost layer of a 3d shape.</p>
---	--

Right angle - An angle of 90° , as in a corner of a square
 Straight line - A line that does not curve.

Year 3	Unit Title: Geometry (Summer block 2)
NC Objectives:	
<p>Properties of Shapes</p> <ul style="list-style-type: none"> draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them recognise angles as a property of shape or a description of a turn identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	
Previous Learning	Future Learning
<p>Properties of shapes</p> <ul style="list-style-type: none"> identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] compare and sort common 2-D and 3-D shapes and everyday objects. <p>Position and direction</p> <ul style="list-style-type: none"> order and arrange combinations of mathematical objects in patterns and sequences use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). 	<p>Properties of Shapes</p> <ul style="list-style-type: none"> compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify acute and obtuse angles and compare and order angles up to two right angles by size identify lines of symmetry in 2-D shapes presented in different orientations complete a simple symmetric figure with respect to a specific line of symmetry. <p>Position and Direction</p> <ul style="list-style-type: none"> describe positions on a 2-D grid as coordinates in the first quadrant describe movements between positions as translations of a given unit to the left/right and up/down plot specified points and draw sides to complete a given polygon.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Irregular In geometry, irregular is a term used to describe shapes that are not regular. Parallel Line - segments that can be described as parallel must be on the same plane and will never meet, regardless of how far either or both line segments are extended. Perpendicular - A pair of line segments (or surfaces) can be described as perpendicular if they intersect at (or form) a right angle. Regular - Regular 2-D shapes (regular polygons) have angles that are all equal and side lengths that are all equal. Regular 3-D shapes (the Platonic</p>

	<p>Solids) are those that have congruent (exactly the same) faces of a single regular polygon.</p> <p>Hemisphere - A hemisphere is a 3D geometric figure that is half of a sphere.</p> <p>Prism - A prism is a 3-D solid with two identical, parallel bases and otherwise rectangular faces.</p> <p>Square based/triangular based pyramid - A pyramid is a 3-D shape with a 2-D shape (which gives the pyramid its name) as a base and triangular faces that taper to a point called a vertex or apex.</p> <p>Acute angle - An angle that is smaller than a right angle.</p> <p>Compass point - The directions on the magnetic compass. The 4 main points are North, South, East and West.</p> <p>Diagonal - A diagonal is a straight line joining two nonadjacent vertices of a shape, that is, two corners of a shape that are not next to each other.</p> <p>Horizontal - A line that runs right and left across the page.</p> <p>Obtuse angle - An angle that is greater than a right angle but less than 180 degrees.</p> <p>Vertical - A line that runs top to bottom down the page.</p>
--	--

Year 4	Unit Title: Geometry (Summerblock 2)	
NC Objectives:		
<p>Properties of Shapes</p> <ul style="list-style-type: none"> compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify acute and obtuse angles and compare and order angles up to two right angles by size identify lines of symmetry in 2-D shapes presented in different orientations complete a simple symmetric figure with respect to a specific line of symmetry. <p>Position and Direction</p> <ul style="list-style-type: none"> describe positions on a 2-D grid as coordinates in the first quadrant describe movements between positions as translations of a given unit to the left/right and up/down plot specified points and draw sides to complete a given polygon. 		
Previous Learning	Future Learning	
<p>Properties of Shapes</p> <ul style="list-style-type: none"> draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them recognise angles as a property of shape or a description of a turn identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn 	<p>Properties of Shapes</p> <ul style="list-style-type: none"> identify 3-D shapes, including cubes and other cuboids, from 2-D representations know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees (o) identify: angles at a point and one whole turn (total 360), angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180), other multiples of 90o use the properties of rectangles to deduce related facts and find missing lengths and angles 	

<p>and four a complete turn; identify whether angles are greater than or less than a right angle</p> <ul style="list-style-type: none"> identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	<ul style="list-style-type: none"> distinguish between regular and irregular polygons based on reasoning about equal sides and angles. <p>Position and Direction</p> <ul style="list-style-type: none"> 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.
<p>Key Knowledge and Common Misconceptions</p>	<p>Vocabulary</p>
<p>Please see the White Rose 'Scheme of Learning' for this area.</p> <p>Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for'</p> <p>You will also find key questions and possible sentence stems here.</p>	<p>Construct - Build or make.</p> <p>Equilateral - Having all sides the same length.</p> <p>Heptagon - A plane figure with seven straight sides and angles.</p> <p>Isosceles Having two sides of equal length. Isosceles triangles have two equal sides; isosceles trapezia have two equal, non-parallel sides.</p> <p>Kite - A flat shape with 4 straight sides that:</p> <ul style="list-style-type: none"> has two pairs of equal length sides. each pair is made of two adjacent sides (they meet) that are equal in length. The angles are equal where the pairs meet. <p>Oblong - A rectangle that is not a square.</p> <p>Parallelogram - A 2-D shape that has two pairs of parallel sides and equal opposite angles.</p> <p>Polygon - A plane shape (two-dimensional) with straight sides.</p> <p>Rectilinear - A rectilinear shape has straight line edges which are perpendicular (all meet at right angles).</p> <p>Rhombus - An equilateral parallelogram with four equal length sides.</p> <p>Scalene - A scalene triangle has three unequal sides and three unequal angles.</p> <p>Trapezium - A quadrilateral with exactly one pair of parallel sides.</p> <p>Cylindrical - Like a cylinder.</p> <p>Polyhedron - A solid with flat faces. Each flat face is a polygon.</p> <p>Spherical - Shaped like a sphere.</p> <p>Tetrahedron - A polyhedron (a flat-sided solid object) with 4 faces.</p> <p>Coordinate - The position of a point, usually described using pairs of numbers.</p> <p>Degree - A measure for angles. There are 360 degrees in a full rotation.</p> <p>Grid - A series of evenly divided and equally spaced shapes, usually squares.</p> <p>Plot - To mark out a point on a graph or grid.</p> <p>Point - The precise location of a position on a 2-D plane.</p> <p>Protractor/angle measurer - A measuring device for measuring the size of an angle. Angles are measured in degrees (°).</p> <p>North-east, northwest, south-east, south-west, NE, NW, SE, SW</p> <p>Reflection - An image or shape as it would be seen in a mirror.</p> <p>Rotation - The action of rotating about an axis or centre.</p> <p>Set square - A right-angled triangular plate for drawing lines, especially at 90°, 45°, 60°, or 30°.</p> <p>Translation "Sliding": moving a shape without rotating or flipping it. The shape still looks exactly the same, just in a different place.</p>

Year 5	Unit Title: Geometry (Summer block 1)
NC Objectives:	
<p>Properties of Shapes</p> <ul style="list-style-type: none"> • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (o) • identify: angles at a point and one whole turn (total 360), angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180), other multiples of 90o • use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles. <p>Position and Direction</p> <ul style="list-style-type: none"> • 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. 	
Previous Learning	Future Learning
<p>Properties of Shapes</p> <ul style="list-style-type: none"> • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry. <p>Position and Direction</p> <ul style="list-style-type: none"> • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon. 	<p>Properties of Shapes</p> <ul style="list-style-type: none"> • draw 2-D shapes using given dimensions and angles • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. <p>Position and Direction</p> <ul style="list-style-type: none"> • describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Congruent - Used to describe two shapes or figures which are exactly the same size. Decagon - A polygon with ten sides and ten angles. Diagonal - A line segment that goes from one corner to another, but is not an edge. Dodecagon - A polygon with twelve sides and twelve angles. Nonagon - A polygon with nine sides and nine angles.</p>

	<p>Quadrant - Any of the 4 areas made when we divide up a plane by an x and y axis.</p> <p>X-axis - The line on a graph that runs horizontally (left-right) through zero. It is used as a reference line so you can measure from it.</p> <p>Y-axis - The line on a graph that runs vertically (up-down) through zero. It is used as a reference line so you can measure from it.</p> <p>Octahedron - A polyhedron (a flat-sided solid object) with 8 Faces.</p> <p>Angle at a point - Angles that meet at a point that sum to 360°.</p> <p>Angle on a line - Angles formed on a straight line that sum to 180°.</p> <p>Coordinate - A set of values that show an exact position. On graphs it is usually a pair of numbers: the first number shows the distance along, and the second number shows the distance up or down.</p> <p>Reflex angle - An angle that is greater than 180°.</p> <p>Transformation - A collective term for the ways that shapes can be changed, resulting in congruent or similar shapes, i.e. translation, reflection, rotation or enlargement.</p>
--	---

Year 6	Unit Title: Geometry (Summer block 1)
NC Objectives:	
<p>Properties of Shapes</p> <ul style="list-style-type: none"> draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. <p>Position and Direction</p> <ul style="list-style-type: none"> describe positions on the full coordinate grid (all four quadrants) draw and translate simple shapes on the coordinate plane, and reflect them in the axes. 	
Previous Learning	Future Learning
<p>Properties of Shapes</p> <ul style="list-style-type: none"> identify 3-D shapes, including cubes and other cuboids, from 2-D representations know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees (o) identify: angles at a point and one whole turn (total 360), angles at a point on a straight line and ½ a turn (total 180), other multiples of 90o 	<ul style="list-style-type: none"> Key Stage Three

<ul style="list-style-type: none"> • use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles. <p>Position and Direction</p> <ul style="list-style-type: none"> • 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. 	
<p>Key Knowledge and Common Misconceptions</p>	<p>Vocabulary</p>
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Arc - A portion of the circumference of a circle Circumference - The perimeter/boundary of a circle. Compass - A tool for creating curved lines, arcs and circles. Intersect - The point at which two (or more) lines meet is where they intersect. Diameter - A line from one point of the circumference of a circle to another on the opposite side, which must pass through the centre of the circle. Radius - A line from one point of the circumference of a circle to the centre of the circle. Similar - Similar shapes are those which have the same internal angles and where the side lengths are in the same ratio or proportion. Enlarging a shape by a scale factor (for example by doubling all side lengths) creates a similar shape. Dodecahedron - A polyhedron (a flat-sided solid object) with 12 Faces. Net - A group of 2-D shapes which, when folded and connected, forms a 3-D polyhedron. Origin - The point at which axes in a coordinates grid cross; the point (0,0). Vertically opposite angles - Angles which are positioned opposite to one another when two lines intersect.</p>

Statistics

Year 2	Unit Title: Statistics (Summer block 2)
NC Objectives:	
<ul style="list-style-type: none"> interpret and construct simple pictograms, tally charts, block diagrams and simple tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ask and answer questions about totalling and comparing categorical data. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> pictures representing more than 1 when solving problems 	<ul style="list-style-type: none"> interpret and present data using bar charts, pictograms and tables solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Block graph - The pre-cursor to the bar graph, this representation of data has an x- and y-axis and one block represents one item. Each block is adjoined to the adjacent block. Chart - A table or a graph. ' Data - Quantitative information which has been counted or measured. Table - A structure organised into columns and rows, in which data can be recorded. Frequency - The number of times something occurs within a data set. Label - The horizontal label across the bottom and the vertical label along the side tells us what kinds of facts are listed in a graph. Least common - The smallest amount or number. Least popular - The smallest amount or number. Most common - The biggest amount or number. Most popular - The biggest amount or number. Pictogram - A representation of data using pictures or symbols. Represent - To present something in a certain way. Tally - A form of counting. Each tally is a vertical mark. After the fourth vertical mark, a fifth horizontal/diagonal mark is drawn to create a group of five. Title - The title of a graph tells you what the graph is about.</p>

Year 3	Unit Title: Statistics (Summer block 2)
NC Objectives:	
<ul style="list-style-type: none"> interpret and present data using bar charts, pictograms and tables 	

<ul style="list-style-type: none"> 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. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> interpret and construct simple pictograms, tally charts, block diagrams and simple tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ask and answer questions about totalling and comparing categorical data. 	<ul style="list-style-type: none"> interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Axis (plural axes) - A real or imaginary reference line. The y-axis (vertical) and x-axis (horizontal) on charts and graphs are used to show the measuring scale or labels for the variables. Bar graph - A representation of data in which the frequencies are represented by the height or length of the bars. Carroll diagram - A way of sorting objects, numbers and shapes by their traits. Frequency - The number of times an event or a value occurs. Horizontal - Horizontal refers to planes and line segments that are parallel to the horizon. Venn diagram - An illustration that uses circles to show the relationships among things or finite groups of things.</p>

Year 4	Unit Title: Statistics (Summer block 2)
NC Objectives:	
<ul style="list-style-type: none"> interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> interpret and present data using bar charts, pictograms and tables 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. 	<ul style="list-style-type: none"> <i>solve comparison, sum and difference problems using information presented in a line graph</i> <i>complete, read and interpret information in tables, including timetables.</i>
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Data - A collection of facts, such as numbers, words, measurements, observations or even just descriptions of things. Interval - An interval on a graph's axis lies between two values. Survey - To gather information by individual samples so we can learn about the whole thing.</p>

	Time graph - A graph that uses lines to connect the points on a data chart. Used to present continuous data, such as change over time.
--	--

Year 5	Unit Title: Statistics (Spring block2)
NC Objectives:	
<ul style="list-style-type: none"> • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. 	<ul style="list-style-type: none"> • interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average.
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Line graph - A graph with points connected by lines to show how something changes in value:</p> <ul style="list-style-type: none"> • as time goes by, • or as something else changes.

Year 6	Unit Title: Statistics (Spring block2)
NC Objectives:	
<ul style="list-style-type: none"> • interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average. 	
Previous Learning	Future Learning
<ul style="list-style-type: none"> • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables. 	<ul style="list-style-type: none"> • Key stage Three
Key Knowledge and Common Misconceptions	Vocabulary
<p>Please see the White Rose 'Scheme of Learning' for this area. Key Knowledge can be found under the heading 'Notes and Guidance'. Misconceptions can be found under the heading 'Things to look out for' You will also find key questions and possible sentence stems here.</p>	<p>Mean - The Arithmetic Mean is the average of the numbers: a calculated "central" value of a set of numbers. To calculate it:</p> <ul style="list-style-type: none"> • add up all the numbers, • then divide by how many numbers there are. <p>Pie chart - A representation of a set of data where each segment represents one group in proportion to the whole.</p>

	Statistics - The study of data: how to collect, analyse, summarise and present it.
--	--

Appendix

Reception Shape, Space and Measure Overview (1 x session per week using Master the Curriculum based on White Rose)							
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Just like me – Identify matching buttons	Just like me – Sorting natural materials	Just like me – Compare taller and shorter	Just like me – AB patterns (natural objects)	Just like me – AB shape patterns	Just like me – Spot the mistake in repeated patterns	
Autumn 2	It's me 123 – Sorting shapes (triangles & circles)	It's me 123 – Make shape pictures (triangles & circles)	It's me 123 – Positional language – Where's teddy?	Light and Dark – sorting rectangles and squares	Light and Dark – rectangles and squares	Light and Dark – Day and night	Light and Dark – Sequencing events
Spring 1	Alive in 5 – Balance scales	Alive in 5 – Full and empty	Alive in 5 – Measuring capacity	Growing 678 – Comparing height	Growing 678 – Comparing length	Growing 678 – Measuring time	
Spring 2	Building 9 & 10 – Matching 3D shapes (real life objects)	Building 9 & 10 - Patterns	Consolidation - Measurement	Consolidation – Length and Height	Consolidation – 3D Pattern assessment	Consolidation – Investigate 3D shapes	
Summer 1	To 20 and beyond – Find my match (shapes)	To 20 and beyond – Find my match (models)	To 20 and beyond - Replicate my shape	First, then & now – Making new shapes - triangles	First, then & now – Making new shapes - Squares	First, then & now - Tangrams	
Summer 2	On the move – How many legs? Problem solving	On the move – Building bridges – which bridge is longest?	On the move – Cuisenaire rods – comparing lengths	On the move - Patterns	On the move – making maps	On the move – Obstacle course	On the move – X marks the spot
Continuous provision will also provide opportunities for children to develop shape, space and measure knowledge and understanding.							