Nancealverne Maths Offer and Scheme of Work

Intent: At Nancealverne we believe maths to be a key life skill that supports pupils throughout their daily lives, both at school and in the future. We aim to build all pupils' skills in the fundamentals of maths, their fluency and ability to reason and problem solve, preparing them well for each next step on their journey, whether to the next Key Stage or onward into adulthood. Through a mastery approach, our maths offer ensures that all pupils have access to high quality teaching and learning of mathematics that encourages pupils to fully embed developed skills in their long term memory, use the key vocabulary obtained appropriately and apply their learnt skills to solve problems within their everyday lives with greater confidence/ fluency.

Implementation: - Maths learning encompasses 3 main areas: number (including operations), measurement (including time and money) and Geometry, with an additional focus on financial understanding. Maths is delivered both in discrete lessons throughout the week and across each day, with all staff taking pains to ensure that opportunities for maths learning are maximised (both within structured and unstructured sessions). Maths teaching begins informally, through play, in our EYFS group, becoming more formal as we progress through the key stages. Maths is delivered as a core subject from KS1-KS4, underpinned through a mastery approach, with opportunities to gain formal qualifications (e.g. Asdan and OCR Functional Skills) in KS5, as well as developing students' preparedness for adulthood through application of skills to increasingly complex real-life situations. Teaching and learning is highly personalised with individual pupil starting points taken into account and use of learning pathways to support progress. These pathways start with pre-formal learners (on our learning to learn pathway), who are taught holistically, moving through a semi-formal pathway (with a focus on multi-sensory play, games and rhymes/songs), to formal curriculum pathways (ready to learn) with discrete curriculum sessions. Within the formal pathways, all new learning begins with use and exploration of concrete resources (e.g. Numicon, Diennes blocks, shapes), moving to pictorial representations and structures (e.g. 10s frames, number lines, models and images), towards abstraction. This sequence is fluid and teaching moves between concrete, pictorial and abstract throughout teaching sessions and units of work, ensuring that pupils are supported and learning is scaffolded to ensure maximum progress and challenge. There is a focus on practical, engaging and fun lessons where pupils are encouraged to talk and share ideas and to focus on use of mathematical vocabulary to explain their work and to reason and explain. Varied contexts are explored, taking into account pupils' interests and use of real-life scenarios and opportunities.

Impact: - All pupils make at least expected progress towards challenging maths targets (using the B Squared assessment system), with many exceeding expected progress. Pupils' learning is embedded and secure, enabling them to solve problems and to reason mathematically, preparing them effectively for the next stage of their learning. Effective curriculum planning allows for smooth transition between key stages, with clear progressions mapped across the key stages. Pupils leave school well prepared for the next stage in their lives, able to live as independently as possible within their communities. Ongoing formative assessment is supported by termly data collection to ensure that pupils' progress is maximised through early interventions and additional challenge. In some classes, overarching maths targets support progress in key skills across the curriculum.

Implementation (delivery) of the Maths offer

Nancealverne school will ensure there is a clear journey for maths learning which delivers/ sequences the **intent** of our Maths offer, encouraging all pupils to reach their full potential (**impact**). It is essential that the **implementation** of Maths via our curriculum offer works towards clearly defined 'end points' which shape our provision, ensuring all pupils in our school are prepared well for their next stage/ steps. The Maths offer will always be informed by pupils' engagement needs and interests, particularly as pupils embark upon their school journey. Assessment of pupils' learning and the progress they make will additionally inform this offer ensuring we are reflective /responsive to information obtained. Our Maths curriculum will provide pupils with a breadth and depth of study with sufficient challenge in learning content to ensure no pupil is disadvantaged. The implementation of Maths will ensure learning in each area of our school is part of a learning continuum using the main principles outlined below in our practice.

EYFS	**L2L/ B2L** **KS 1 (Yr2) – KS4**	**R2L** **KS 1 (Yr 2) – KS 3**	**R2L** **Key Stage 4*** *curriculum/ long term planning offer building on learning achieved within KS3*	**Post 16**
Within EYFS provision mathematics learning is interest led, focused upon promoting engagement, interest and early skill development in this specific area of learning. The 5 counting principles will be introduced to support current and all subsequent maths learning; such principles will continue to inform the school maths offer as pupils move out of EYFS and into KS1.	To ensure the 'Maths' curriculum is purposeful and maintains its focus upon developing pupils' pre-requisites to learning (Cognition and Learning), schools will plan/ differentiate learning outcomes within any of the seven areas of engagement.	Once pupils personalised learning pathways have been identified (informed via assessment/ observational outcomes) those following the R2L pathway will work more formally within subject specific learning, developing maths skills through discreet maths lessons and core skills activities within the areas of number, shape, measure, geometry and statistics	At Key stage 4 there will be an examination of the individual skills learnt within all areas of the maths curriculum encouraging pupils to begin to take these skills to use/ apply and develop them further within wider settings. The expectation is that students will develop a functionality within skills obtained. Modules of accreditation/ formal qualifications will be pursued where these have been identified as holding meaning and value to pupil.	Within Post 16 maths learning weaves throughout the curriculum offer. It forms an integral part of the curriculum ensuring that maths skills can be used, developed and generalised within the areas of work-related learning, life skills and health and wellbeing and into adult life therefore developing an application of the skills learned. Accreditation opportunities will continue.
→	→	→	→	→
Development of Mathematics within the breadth of the EYFS offer delivered via a maths mastery approach	Development of engagement skills / very early maths concepts with an emphasis on generalizing learned skills to wider contexts/ people	Development of Maths skills within the breadth of offer delivered via a maths mastery approach	Further extend learning outside of the classroom; continue with maths mastery approach *Preparing for adulthood EHCP outcomes Yr10	Development of functional maths skills, preparing pupils for adult life

Scheme of Work - Intent

The **INTENT** of our R2L Maths offer and scheme of work (breadth of study end-points outlined within each Maths area to support the **IMPLEMENTATION),** is to enable our pupils to develop/ further develop their skills and conceptual understanding of number (including operations), measurement, geometry and statistics. Through the identification of such areas we will enable pupils to develop their skills to:

- become more fluent in the pre-requisite skills found within Cognition & Learning (B^2 fundamentals of early mathematics)
- become fluent in the fundamentals of mathematics
- learn, use, extend & apply a wider range of mathematical language
- develop their problem-solving skills beginning to apply their knowledge rapidly & accurately to problems
- break down problems into a series of simpler steps & persevering in seeking solutions
- reason mathematically by following a line of enquiry
- generalise learned skills within wider settings/ contexts
- begin to apply their mathematics to a variety of routine and non-routine problems with increasing sophistication

Organisation:

- All R2L pupils will study Maths daily, which will feature within class timetables, demonstrating equity in the Maths learning we offer
- Maths delivery will ensure the Maths Mastery principles are adopted and implemented within all structured teaching/ learning sessions
- Medium Term Planning for each area of Maths will identify the WALT (end point – all learning remains part of a well-planned sequence)
- Differentiation of learning outcomes designed for each pupil (pupil end points) will enable pupils to work towards personalised learning outcomes (WILF) based upon their skills, knowledge and understanding at that time
- Learning outcomes will be designed using formative assessment outcomes, within a well-planned sequence of learning, leading to cumulative knowledge (knowledge is retained and becomes embedded)
- Workbooks/ sheets will only be used when these hold value to the learning being addressed

Breadth of Study – 'end points'

It is acknowledged that the Maths offer provides pupils with a breadth of learning opportunities with identified end points. We also acknowledge, that pupils additionally need structured opportunities to secure a depth in the concepts, skills and knowledge they acquire. This depth will be achieved via a Mastery approach to all teaching & learning. This approach provides plenty of opportunity for teachers to sequence learning outcomes which enable pupils to build upon their acquired mathematical concepts and their reasoning and problem-solving skills, leading towards a practical application of their skills outside of the class/ school environment. We achieve this by encouraging pupils to build their competencies in their use of concrete objects, pictorial representation and, when ready, abstract methods, weaving such methods throughout sequences of lessons and also within lessons. Through such means we will encourage our pupils to develop the skills to not only 'work mathematically' (formally assessed from B Squared Progression Step 9) but to develop efficient methods/ coping strategies/ functional skills to solve problems efficiently and effectively through their formal Maths offer.

End points for EYFS to KS3 are taken from the EYFS Framework and National Curriculum, as follows- EYFS Framework Early Learning Goals are endpoints for EYFS/Year 1; National Curriculum Year 1 objectives are the end point for KS1/Lower KS2; National Curriculum Year 2 objectives are the end points for Upper KS2; National Curriculum Year 3 objectives are the end points for Lower KS3 and National Curriculum Year 4 objectives are the end points for Upper KS3). ***These are end points - they are not intended to be used as starting points for teaching, but as a guide to progression and appropriate WALTS. These will need to be differentiated/tracked back to individual starting points for each pupil.***

Assessment Framework - Progression Route and Breadth of Study

Number (including calculations) Rationale	Measurement Rationale	Geometry Rationale	Statistics and Probability Rationale
The essentials skills of number will encourage our pupils to develop their skills, knowledge and understanding leading them towards: • the further development their pre-requisite skills within Cognition & Learning • using/understanding whole numbers, fractions, decimals, percentages and place value • using a variety of calculations (addition, subtraction, multiplication and division) within a range of contexts • using simple algebraic forms, developing a confidence by using number in everyday life through functional and practical activities	**The essentials skills of measure will require pupils to:** • use a range of common measures to compare, describe and solve practical problems for lengths and mass/weight, capacity and volume, time and money, measure • record the following: lengths and heights, mass/weight, capacity and volume, time and money • recognise and know the value of different denominations of coins and notes, calculate amounts and give change **Pupils will be encouraged to:** • use and generalise these skills within practical, everyday life skills and functional activities with real purpose	**Through the teaching of Geometry our pupils will develop their ability to:** • recognise, draw, compare and sort different shapes and their properties and to develop positional understanding **Teaching in geometry will**: • incorporate problem solving and reasoning, as well as consolidate and extend knowledge developed in number	**Through the teaching of Statistics, our pupils will develop their skills to:** • record, interpret, collate, sort, organise and compare information • construct and interpret a range of charts and tables • solve problems using information from charts and tables (including timetables)
Breadth of Study It is acknowledged that the Maths offer provides our pupils with a breadth of learning opportunities with identified end points (taken from the EYFS Framework and the National Curriculum). We also acknowledge, that pupils additionally need structured opportunities to secure a depth in the concepts, skills and knowledge they acquire. This depth will be achieved via robust assessment practices and a Mastery approach to all teaching & learning. This approach provides plenty of opportunity for teachers to sequence learning outcomes which enables pupils to build upon their acquired mathematical concepts and their reasoning and problem-solving skills, leading towards a practical application of their skills outside of the class/ school environment. We achieve this by encouraging pupils to build their competencies in their use of concrete objects, pictorial representation and when ready, the use of abstract methods weaving such methods through the breadth of our offer. Through such means we will encourage our pupils to develop the skills to not only 'work mathematically' (formally assessed from Progression Step 9) but to develop efficient methods/ coping strategies/ functional skills to solve problems efficiently and effectively.			
Mathematical Areas EYFS:			
• Number* and place value • Addition • Subtraction Shape, space and measure • *Within number we follow the 5 counting principles**			
Mathematical Areas KS1 - 3:			
• Number and place value • Addition, Subtraction, Multiplication & Division • Fractions (Including Decimals & Percentages) • Ratio, Proportion & Rates of Change • Algebra • Working Mathematically*	• Measurement • Working mathematically*	• Properties of Shape • Position and Direction • Working mathematically*	• Working mathematically* • Probability • Statistics

ASSESSMENT

R2L - Progression Steps:

Progression Steps 1-7 • Number and place value • Addition, Subtraction, Multiplication & Division • Fractions (Including Decimals & Percentages) **Progression Step 8** • Number and place value • Addition, Subtraction, Multiplication & Division • Fractions (Including Decimals & Percentages) • Ratio, Proportion & Rates of Change • Algebra **Progression Step 9** • Working mathematically • Number and place value • Addition, Subtraction, Multiplication & Division • Fractions (Including Decimals & Percentages) • Ratio, Proportion & Rates of Change • Algebra **Progression Step 10** • Working mathematically • Number and place value • Ratio, Proportion & Rates of Change • Algebra	**Progression Steps 1-8** • Measurement • Properties of Shape • Position and Direction **Progression Step 9-10** • Working mathematically • Measurement and Geometry	**Progression Steps 1-8** • Statistics **Progression Step 9-10** • Working mathematically • Probability • Statistics

**It is acknowledged that some pupils may well be working towards GCSE routes; the examination body will outline the key principles of assessment/ moderation/ verification required when examinations are taken*

L2L - Engagement steps:

We acknowledge that for some pupils within our school there is a recognised need to address their developing understanding of very early maths concepts (pre-requisites to learning); early concepts are identified within Cognition & Learning strands. These strands of learning focus upon pupils' developing skills of engagement found within the areas of responsiveness, curiosity, discovery, anticipation, persistence, investigation and initiation. L2L pupils will study maths through bespoke learning targets informed via an observational engagement profile and assessment/EHCP outcomes (B^2 Engagement Steps), which are delivered daily through the school week. Our L2L offer identifies the intent, implementation and impact of our Cognition and Learning offer (Maths).

Maths Mastery - 5 counting principles which guide practice:

1. The one-one principle – *this involves children assigning one number to each object that is being counted. Children need to ensure that they count each object only once ensuring they have counted every object*
2. The stable order principle – *Children understand when counting, the numbers have to be said in a certain order*
3. The cardinal principle – *Children understand that the number assigned to the final object in a group is the total number of objects in that group.*
4. The abstraction principle – *This involves children understanding that anything can be counted including things that cannot be touched including* **sounds and movements e.g. jumps**
5. The order-irrelevance principle – *This involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number*

Long Term Plans

Long Term Outline Plan - Acorns (KS1/Lower KS2)

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Term 1	Place Value - numbers to 5 Addition and Subtraction - sorting Place Value – comparing groups Addition and Subtraction – change within 5 Measurement - time											
Term 2	Addition and Subtraction – numbers to 5 Place Value – numbers to 10 Addition and Subtraction – addition to 10 Geometry – shape and space											
Term 3	Geometry – exploring patterns Addition and Subtraction – count on and back Place Value – numbers to 20 Multiplication and Division – numerical patterns Measurement - measure											

Source: White Rose (EYFS)

Long Term Outline Plan - Sycamore (KS1/Lower KS2)

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Term 1	Number: Place Value (within 10)				Number: Addition and Subtraction (within 10)				Geometry: Shape		Measurement: Time	
Term 2	Number: Addition and Subtraction (within 20)			Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Statistics	
Term 3	Number: Multiplication and Division			Number: Fractions		Geometry: Position and Direction		Measurement: Money		Number: Place Value		

Source: White Rose (Yr 1), amended

Long Term Outline Plan - Juniper (Upper KS2)

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Term 1	Number: Place Value			Number: Addition and Subtraction					Measurement: Money		Geometry: Shape	
Term 2	Number: Multiplication and Division			Number: Fractions		Measurement: Length and Height; Mass			Measurement: Time		Statistics	
Term 3	Number: Place Value			Geometry: Position and Direction		Number: Operations		Measurement: Capacity and Temperature		Measurement: Money/Time	Statistics	

Source: White Rose (Yr 2), amended

Long Term Outline Plan - Palm (Lower KS3)

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Term 1	Number: Place Value			Number: Addition and Subtraction					Measurement: Money		Geometry: Properties of Shape	
Term 2	Measurement: Length (including perimeter and area), Mass			Number: Multiplication and Division				Number: Fractions		Measurement: Time		
Term 3	Number: Place Value		Geometry: Position and Direction	Number: Operations (inc Ratio and Algebra)			Measurement: Capacity and Temperature		Measurement: Money/Time	Statistics		

Source: White Rose (Yr 3), amended

Long Term Outline Plan - Elm (Upper KS3)

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Term 1	Number: Place Value			Number: Addition and Subtraction					Measurement: Money		Geometry: Properties of Shape	
Term 2	Number: Multiplication and Division				Number: Fractions (and Decimals)		Measurement: Time		Measurement: Length, Perimeter, Area; Mass			
Term 3	Number: Place Value		Geometry: Position and Direction	Number: Operations (inc Ratio and Algebra)			Measurement: Capacity and Temperature		Measurement: Money/Time	Statistics		

Source: White Rose (Yr 4), amended

Long Term Plans

Number and Operations- Outline by Key Stage (Intent)

INTENT of Number Areas:

Our teaching of the areas of Number **which informs our WALT** will enable pupils to develop the skills and knowledge to be fluent and confident in using and applying number within a wide range of activities and settings which encourages them to:

- problem solve and use number with different contexts and situations
- practice, use and apply their skills and knowledge to aid fluency
- practice, use and apply their skills within everyday activities outside of classroom settings and within the context of their adult life
- be able to read and spell mathematical vocabulary

WALT – EYFS will promote knowledge and understanding of:	**WALT - Key Stage 1 – 2** will continue to consolidate the skills achieved within EYFS and further promote knowledge and understanding of:	**WALT - Key Stage 3** will continue to consolidate the skills achieved within KS 1/2, develop pupil's fluency skills and further promote knowledge and understanding of:	**WALT – Key Stage 4** will continue to address the continued development of maths skills via a more functional programme of learning delivered in wider contexts (classroom-based, school-based and community-based activities) which enables them to:	**WALT – Post 16** will continue to develop students' confidence in using maths, which helps them become more independent in their daily adult lives (work experiences/community engagement, etc)
• skills in counting (following the 5 counting principles), understanding and using numbers • calculation which include simple addition and subtraction problems • how to solve problems, including doubling, halving and sharing	• mental fluency with whole numbers, counting and place value • working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools) • number bonds to 20 (and 100) and be precise in using and understanding place value	• whole numbers and the four operations, including number facts and the concept of place value • efficient written and mental methods and perform calculations accurately with increasingly large numbers • ways to solve a range of problems, including with simple fractions, decimals and place value	• demonstrate their mathematical skills in a range of contexts and for various purposes via cross curricula links • have their abilities further developed and recognised so that they are enabled to apply and transfer skills • Are provided with a more functional programme of learning to incorporate classroom-based, school-based and community-based activities	• understand a situation and choose an approach to tackle the problem • formulate a model using mathematics • use mathematics to provide answers • interpret and check the results • evaluate the model and approach • explain the analysis and results • apply and adapt this experience in other situations as they arise

Maths Scheme of Work - Number: Number and Place Value

Early Learning Goals & Yr1- Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • count reliably with numbers from 1 – 20 • place numbers from 1 – 20 in order • say which number is one more or one less than a given number ***Earlier milestones:*** ***30-50 months*** *Recites numbers in order to 10* *Knows that numbers identify how many objects are in a set* *Compares two groups of objects, saying when they have the same number* *Shows an interest in representing numbers* *Realises not only objects, but anything can be counted, including steps, claps and jumps* ***40-60+ months*** *Counts up to 3 or 4 objects, by saying one number name for each item* *Counts actions or objects which cannot be moved* *Counts objects to 10* *Counts out up to 6 objects from a larger group* *Estimates how many objects they can see and checks by counting them* *Uses the language of more and fewer to compare sets of objects* *Records using marks they can interpret and explain*	**Breadth of study end points:** • count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals, count in different multiples including ones, twos, fives and tens • given a number, identify one more and one less • identify and represent numbers using concrete objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 – 20 in digits and words • ***Notes and Guidance:*** *Pupils practice counting, ordering and indicating quantity* *Pupils begin to recognise place value in numbers beyond 20, by reading, writing, counting and comparing numbers, supported by objects and pictorial representations* *Practice counting as reciting numbers and as enumerating objects and counting in 2s, 5s and 10s from different multiples to develop recognitions of patterns in the number system (e.g. odd and even)* *Recognise and create repeating patterns with objects and shapes.*	**Breadth of study end points:** • count in steps of 2, 3, and 5 from 0, and count in tens from any number, forward or 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 ***Notes and Guidance:*** *Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems.* *Count in multiples of 3 to support later understanding of 1/3.* *As they become more confident with numbers to 100, pupils are introduced to larger numbers to develop further their recognition of patterns* *Pupils should partition numbers in different ways (for example 23 = 20 + 3 and 23 = 10 + 13) to support subtraction* *Discuss and solve problems that emphasize the value of each digit in 2-digit numbers* *Begin to understand zero as a place holder*	**Breadth of study end points:** • count from 0 in multiples of 4, 8, 50 and 100; finding 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 to at least 1000 in numerals and in words • solve number problems and practical problems involving these ideas ***Notes and Guidance:*** *Pupils now use multiples of 2, 3, 4, 5, 8, 10, 50 and 100* *They use larger numbers to at least 1,000, applying partitioning related to place value using varied and increasingly complex problems (e.g. 146 = 100 + 40 + 6 and 146 = 130 + 16)* *Using a variety of representations, including those related to measure, pupils continue to count in 1s, 10s and 1000, so that they can become fluent in the order and place value of numbers to 1,000*	**Breadth of study end points:** • count in multiples of 6, 7, 9, 25 and 100; • Find 1,000 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 1,000 • Identify, represent and estimate numbers using different representations • Round any number to the nearest 10, 100 or 1,000 • 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 **TO EXTEND:** • Read, write and order numbers to 1,000,000 and 10,000,000 • round any number • Count forwards and backwards with positive and negative numbers, including crossing zero ***Notes and Guidance:*** *Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1,000, including counting in 10s and 1000s* *They begin to extend their knowledge of the number system to include the decimal numbers and fractions they have met so far* *Connect estimation and rounding numbers to the use of measuring instruments*

KEY VOCABULARY - EYFS/Y1 (Acorns) - number, one, two, three… to twenty and beyond, teens numbers, eleven, twelve… twenty, none, zero, how many, count, count (up) to, count on (from, to), count back (from, to), count in 1s, 2s, 5s 10s, is the same as, more, less, odd, even, few, pattern, pair, ones, tens, digit, more, larger, bigger, greater, fewer, smaller, less, fewest, smallest, least, most biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third…. twentieth, last, last but one, before, after, next, between, guess, estimate, nearly, close to, about the same as, just over, just under, too many, too few, enough, not enough; **Yr 2-3 (Sycamore) -** numeral, twenty-one, twenty-two… one hundred, forwards, backwards, equal to, equivalent to, most, least, many, multiple of, half-way between, above, below, roughly; **Yr 4-6 (Juniper)-** two hundred….one thousand, count in 3s, 4s and so on, tally, sequence, continue, predict, rule, greater than, >, less than, <, equal to, =, hundreds, one-, two- or three-digit number, place, place value, stands for, represents, exchange, twenty-first, twenty-second…, exact, exactly; **LKS3 (Palm)** - count in 8s, 50s and so on to hundreds, factor of, relationship, Roman numerals, one hundred more, one hundred less, approximate, approximately, round, nearest, round to the nearest ten, hundred, round up, round down; **UKS3 (Elm)** - ten thousand, hundred thousand, million, count in 6s, 7s, 9s, 25s, next, consecutive, integer, positive, negative, above/below zero, minus, negative numbers, one thousand more, one thousand less, round to the nearest thousand; **EXTEND TO -** greater than or equal to ≥, less than or equal to ≤, formula, square number, prime number, ascending/descending order, factorise, prime factor.

Scheme of Work - Number: Addition & Subtraction

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • Using quantities and objects, add and subtract two single-digit numbers and count on or back to find the answer • Solve simple practical problems using objects • Solve problems including doubling and halving ***Earlier milestones:*** ***30-50 months*** *Separates a group of 3 or 4 objects in different ways, beginning to realise that the total is the same* ***40-60+ months*** *Finds the total number of items in two groups by counting all of them* *In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting* *Begins to identify own mathematical problems based on own interests and fascinations*	**Breadth of study end points:** • 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 simple one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems (e.g. 7 = ☐ - 9) ***Notes and Guidance****:* *Pupils memorise and reason with number bonds to 10 and 20 in several forms (e.g. 9 + 7 = 16; 16 - 7 = 9; 7 = 16 - 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations* *Pupils combine and increase numbers, counting forwards and backwards* *They discuss and solve problems in familiar practical contexts, including using quantities; Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of additional and subtraction and are enabled to use these operations flexibly*	**Breadth of study end points:** • solve simple one-step 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 missing number problems ***Notes and Guidance:*** *Pupils extend their understanding of the language of addition and subtraction to include sum and difference.* *Pupils practise addition and subtraction to 20 to become increasingluy fluet in deriving associated facts* *Check calculations, including by adding to check subtraction and adding numbers in different order to check addition.* *Recording addition and subtraction in columns support place value and prepares for formal written methods*	**Breadth of study end points:** • 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 ***Notes and Guidance:*** *Pupils practise solving varied addition and subtraction questions.* *Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to 3 digits to become fluent*	**Breadth of study end points:** • 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 **TO EXTEND:** • add and subtract numbers with more than 4-digits • Add and subtract increasingly large numbers mentally • Use rounding to check answers • Solve multi-step problems in different contexts ***Notes and Guidance:*** *Pupils continue to practice both mental methods and columnar additional and subtraction with increasingly large numbers to aid fluency*

KEY VOCABULARY - EYFS/Yr 1 (Acorns) - group, add, more, and, make, sum, total, altogether, double, one more, two more…. ten more, how many more to make…?, how many more is … than … ?, how much more is ….?, take away, how many are left/left over? How many have gone?, one less, two less, ten less …., how many fewer is … than ..? how much less is …?, difference between; **Yr 2-3 (Sycamore) -** addition, near double, half, halve, subtract, equals, is the same as, number bonds/pairs, missing number; **Yr 4-6 (Juniper)** - one hundred more, one hundred less, number facts, tens boundary; **LSK3 (Palm) -** hundreds boundary; **UKS3 (Elm) -** inverse; **EXTEND TO -** ones boundary, tenths boundary.

Maths Scheme of Work - Number: Multiplication and Division

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • Solve problems including doubling and halving	**Breadth of study end points:** • 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 **Notes and Guidance:** *through grouping and sharing small quantities, pupils begin to understand multiplication and division; doubling numbers and quantities and finding simple fractions of objects, numbers and quantities* *make connections between arrays, number patterns and counting in 2s 5s and 10s*	**Breadth of study end points:** • 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 (×), division (÷) and equals (=) signs • recognise and use the inverse relationship between multiplication and division in calculations • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve one-step problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts ***Notes and Guidance:*** *Pupils are introduced to multiplication tables, connecting them to each other, the 10 times table to place value and 5s to the clock face* *Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition.* *Pupils begin to relate these to fractions and measures* *Use commutativity and inverse relationships to develop multiplicative reasoning (e.g. 4 x 5 = 20 and 20 ÷ 5 = 4)*	**Breadth of study end points:** • 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 efficient written methods • solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects ***Notes and Guidance:*** *Pupils continue to practice their mental recall of multiplication tables when calculating mathematical statements to improve fluency. Through doubling, they connect the 2, 4 and 8 times tables* *Pupils develop efficient mental methods (e.g. using commutativity and associativity (e.g. 4x12x5 = 4x5x12= 20x12 =240) and multiplication and division facts (e.g. using 3x2=6 6÷3=2) to derive related facts* *Pupils develop reliable written methods for multiplication and division, starting with calculations of 2-digit numbers by 1-digit numbers and progressing to the formal written methods of short multiplication and division* *Pupils solve simple problems in contexts, deciding which operations to use and why. There include measuring and scaling contexts and correspondence problems (e.g. 3 hats and 4 coats, how many different outfits)*	**Breadth of study end points:** • recall multiplication and division facts for multiplicaton tables up to 12 x 12 • use place value, known and derived facts to multiply and divide mentally, including: -multiplying by 0 and 1 - dividing by 1 - multiplying together 3 numbers • recognise and use factor pairs and commutativity in mental calculations • multiply 2-digit and 3-digit numbers by a 1-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply 2-digit numbers by 1-digit, integer scaling problems and harder correspondence problems (e.g. menu items) **TO EXTEND:** • Identify multiples and factors, including finding all factors pairs of a number and common factors of two numbers • Know and use the vocabulary of prime numbers, prime factors and composite (non prime) numbers • Divide numbers up to to 4 digits by a 1-digit number using formal method of short division • Multiply numbers up to 4 digits to a 1 or 2 digit number using a formal written method, including long multiplication for 2 digit numbers • Multiply and divide whole numbers and those involving decimals by 0, 100 and 1,000 ***Notes and Guidance:*** *Pupils practice mental methods and extend this to 3-digit numbers to derive facts (e.g. 600 ÷ 3 = 200 can be derived from 2 x 3 = 6)* *Use knowledge of order of operations to carry out calculations involving the 4 operations*
KEY VOCABULARY – EYFS/Yr 1 (Acorns) - sharing, doubling, halving, number patterns; **Yr 2-3 (Sycamore) -** multiplication, multiply, multiplied by, multiple, division, dividing, grouping, array; **Yr 4-6 (Juniper) -** groups of, times, once, twice, three times….ten times, repeated addition, divide, divided by, divided into, share, share equally, left, left over, one each, two each, three each....ten each, group in pairs, threes… tens, equal groups of, row, column, multiplication table, multiplication fact, division fact; **LKS3 (Palm) -** factor, product, remainder; **UKS3 (Elm) -** inverse, square, squared, cube, cubed.				

Maths Scheme of Work - Number: Fractions

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • Solve problems including doubling and halving	**Breadth of study end points:** • 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 ***Notes and Guidance:*** *Pupils are taught half and quarter as fractions of discrete and continuous quantities by solving problems using shapes, objects and quantities (e.g. recognise and find half a length, quantity, set of objects or shape* *Pupils connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognizing and combining halves and quarters as parts of a whole*	**Breadth of study end points:** • recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity • write simple fractions e.g. 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2 ***Notes and Guidance:*** *Pupls using fractions as fractions of discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and groups, to numbers when they can be calculated and to measures, finding fractions of lengths, quantities, sets of objects or shapes. They meet ¾ as the first example of a non-unit fraction* *Pupils should count in fractions up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line (e.. 1 ¼ , 1 2/4, (or 1 ½), 1 3/4, 2), This reinforces the concept of fractions as numbers and that they can add up to more than one*	**Breadth of study end points:** • 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 (e.g. 5/7 + 1/7 = 6/7) • compare and order unit fractions with the same denominator • solve problems that involve all of the above ***Notes and Guidance*** *Pupils connect tenths to place value, decimal measures and to division by 10* *They begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence. They should go beyond the [0,1] interval, including relating this to measure* *Pupils understand the relation between unit fractions as operators (fractions of), and division by integers* *They continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity*	**Breadth of study end points:** • recognise and show using diagrams, families of common equivalent fractions • counting up and down in hundredths; recognise that hundredths arise when diving 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 dame denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to ¼, ½ , ¾ • 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 **TO EXTEND:** • recognise mixed numbers and improper fractions • round decimals to the nearest whole number and to one decimal place • recognise the % symbol and understand that it relates to number of parts per hundred, and write %ages as a fraction with a denominator of 100, and as a decimal ***Notes and Guidance:*** *Pupils should connect hundredths to tenths and place value and decimal measures* *They extend use of number line to connect fractions, numbers and measures* *Pupils understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths* *Pupils are taught throughout that decimals and fractions are different ways of expressing numbers and proportions* *Pupils learn decimal notation and the language associated with it, including in the context of measurement*

KEY VOCABULARY – EYFS/Yr 1 (Acorns) - parts of a whole, half, quarter; **Yr 2-3 (Sycamore) -** fraction, equal part, equal grouping, equal sharing, one of two equal parts, one of four equal parts; **Yr 4-6 (Juniper) -** equivalent fraction, mixed number, numerator, denominator, two halves, two quarters, three quarters, one third, two thirds, one of three equal parts; **LKS3 (Palm) -** sixths, sevenths, eighths, tenths; **UKS3 (Elm) -** hundredths, decimal, decimal fraction, decimal point, decimal point, decimal equivalent, proportion; **EXTEND TO -** proper/improper fraction, equivalent, reduced to, cancel, thousandths, percentage, per cent, %, ratio.

Maths Scheme of Work - Number: Ratio and Algebra (KS3 up)

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
n/a	n/a	n/a	**Breadth of study end points:** **RATIO:** • 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 (e.g. of measures, and such as 15% of 360) and use the 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 ***Notes and Guidance:*** *Pupils recognise proportionality in contexts when the relationships between quantities are in the same ratio (e.g. similar shapes and recipes)* *Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation a:b to record their work* *Pupils solve problems involving unequal quantities, e.g. 'for every egg you need 3 spoons of flour; 3/5 of the class are boys.* ***ALGEBRA:*** • use simple formulae • generate and describe linear sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with 2 unknowns • enumerate possibilities of combinations of two variables • ***Notes and Guidance:*** *Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as:* *- missing numbers, lengths, coordinates and angles* *- formulae in maths and science* *- equivalent expressions (e.g. a + b = b + a)* *- generalizations of number patterns* *- number puzzles (e.g. what two numbers can add up to …)*	**Breadth of study end points:** **RATIO:** • 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 (e.g. of measures, and such as 15% of 360) and use the 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 ***Notes and Guidance:*** *Pupils recognise proportionality in contexts when the relationships between quantities are in the same ratio (e.g. similar shapes and recipes)* *Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation a:b to record their work* *Pupils solve problems involving unequal quantities, e.g. 'for every egg you need 3 spoons of flour; 3/5 of the class are boys.* ***ALGEBRA:*** • use simple formulae • generate and describe linear sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with 2 unknowns • enumerate possibilities of combinations of two variables • ***Notes and Guidance:*** *Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as:* *- missing numbers, lengths, coordinates and angles* *- formulae in maths and science* *- equivalent expressions (e.g. a + b = b + a)* *- generalizations of number patterns* *- number puzzles (e.g. what two numbers can add up to …)*
KEY VOCABULARY - Pre KS3 - missing number, quantities, size, scale; **KS3 -** ratio, proportion, in every, for every, formula, formulae, unknown, variable.				

Geometry - Outline (Intent)

INTENT of Geometry and shape:

Our teaching of Geometry and shape **which informs our WALT** will enable pupils to develop the skills and knowledge to be fluent and confident in using and applying geometry and shape within a wide range of activities and settings which encourages them to:

- problem solve and use geometry and space with different contexts and situations
- practice, use and apply their skills and knowledge to aid fluency
- practice, use and apply their skills within everyday activities outside of classroom settings and within the context of their adult life
- be able to read and spell mathematical vocabulary

WALT – EYFS will promote knowledge and understanding which enables pupils to develop their skills to:	**WALT - Key Stage 1 – 2** will continue to consolidate the skills achieved within EYFS and further promote knowledge and understanding to:	**WALT - Key Stage 3** will continue to consolidate the skills achieved within KS 1/2, develop pupil's fluency skills and accuracy and further promote knowledge and understanding to:	**WALT – Key Stage 4** will continue to address the continued development of early maths skills via a more functional programme of learning delivered in wider contexts (classroom-based, school-based and community-based activities) which enables them to:	**WALT – Post 16** will continue to develop student's confidence in using maths which helps them become more independent in their daily adult lives (work experiences/ community engagement etc)
• recognise, create and describe patterns • explore characteristics of everyday objects and shapes • use simple mathematical language to describe them	• recognise, describe, draw, compare and sort different shapes • use the related vocabulary • practice/ use/ apply skills to aid fluency • read and spell mathematical vocabulary, at a level consistent with their reading/spelling skills/knowledge	• analyse shapes and their properties • describe the relationships between them • read and spell mathematical vocabulary correctly and confidently, using their growing word reading and spelling knowledge	• demonstrate their mathematical skills in a range of contexts and for various purposes via cross curricula links • apply and transfer skills	• understand a situation and choose an approach to tackle the problem • formulate a model using mathematics • use mathematics to provide answers • interpret and check the results • evaluate the model and approach • explain the analysis and results • apply and adapt this experience in other situations as they arise

Maths Scheme of work – Geometry: Shape

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • use everyday language to talk about size • compare quantities and objects and to solve problems. • recognise, create and describe patterns. • Explore characteristics of everyday objects and shapes and use mathematical language to describe them ***Earlier milestones:*** ***30-50 months*** *Shows an interest in shape by playing with shapes or making arrangements with objects* *Shows an awareness of similarities of shapes in the environment* *Shows interest in shape by sustained construction activity or by talking about shapes or arrangements* *Shows interest in shapes in the environment* *Uses shapes appropriately for tasks* *Beginning to talk about the shapes of everyday objects, e.g. round and tall* ***40-60+ months*** *Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes* *Selects a particular named shape* *Use familiar objects and common shapes to create and recreate patterns and build models*	**Breadth of study end points:** • recognise and name common 2-D and 3-D shapes, including: - 2-D shapes (e.g. rectangles (including squares), circles and triangles) - 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres) ***Guidance and Notes:*** *Pupils handle common 2D and 3D shapes, naming these and related everyday objects fluently. They recognise these shapes in different orientations and sizes, and now that rectangles, triangles, cuboids and pyramids are not always similar to each other*	**Breadth of study end points:** • identify and describe the properties of 2-D shapes, including the number of sides and 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 ***Guidance and Notes:*** *Pupils handle a wide variety of common 2D and 3D shapes including: quadrilaterals and polygons, cuboids, prisms and cones, and identify the properties of each shape (e.g. numbers of sides/faces). Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces* *Pupils read and write names for shapes that are appropriate for their word reading and spelling* *Pupils draw lines and shapes using a straight edge*	**Breadth of study end points:** • draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations; and describe them with increasing accuracy • 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 ***Guidance and Notes:*** *Pupils' knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygons and polyhedra. Pupils extend their use of the properties of 2D and 3D shapes using accurate language, including lengths of lines and acute and obtuse angles for angles greater or lesser than a right angle.* *Pupils connect decimals and round to drawing and measuring straight lines in centimetres, in a variety of contexts*	**Breadth of study end points:** • 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 2D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry EXTEND TO: • identify 3D shapes, including cubes and other cuboids from 2D representations • recognise, describe and build simple 3D shapes, including making nets • draw 2D shapes using given dimensions and angles • know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles; draw given angles and measure in degrees • use the properties of shapes to deduce related facts and find missing lengths and angles (rectangles first, then triangles, quadrilaterals and regular polygons) • illustrate and name parts of circles, including radius, diameter and circumference and know that diameter is twice the radius ***Guidance and Notes:*** *Pupils continue to classify shapes using geometrically properties, extending to classifying different triangles (e.g. isosceles, equilateral, scalene) and quadrilaterals (e.g. parallelogram, rhombus, trapezium).* *Pupils compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular.* *Pupils draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape.*

KEY VOCABULARY – EYFS/Yr 1 (Acorns) - shape, pattern, flat, curved, straight, round, hollow, solid, sort, make, build, draw, size, bigger, smaller, symmetrical, pattern, repeating pattern, match, 2D - corner, side, rectangle (including square), circle, triangle, 3D - face, edge, vertex, vertices, cube, pyramid, sphere, cone; **Yr 2-3 (Sycamore)** - symmetry, symmetrical pattern, 2D - point, pointed, 3D - cuboid, cylinder; **Yr 4-6 (Juniper) -** surface, line symmetry, 2D - rectangular, circular, triangular, pentagon, hexagon, octagon; **LKS3 (Palm) -** perimeter, 2D - pentagonal, hexagonal, octagonal, quadrilateral, right-angled, parallel, perpendicular, 3D - hemisphere, prism, triangular prism; **UKS3 (Elm) -** line, construct, sketch, centre, angle, right angle, right-angled, base, square-based, reflect, reflection, regular, irregular, 2D - 2-D, two-dimensional, oblong, rectilinear, equilateral triangle, isosceles triangle, scalene triangle, heptagon, parallelogram, rhombus, trapezium, polygon, 3D - 3-D, three-dimensional, spherical, cylindrical, tetrahedron, polyhedron; **EXTEND TO -** radius, diameter, congruent, axis of symmetry, reflective symmetry, 2D - x-axis, y-axis, quadrant, 3D - octahedron, circumference, concentric, arc, intersecting, intersection, plane, 2D - kite, 3D - dodecahedron, net, open, closed.

Maths scheme of work – Geometry – Position & Direction

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • Use everyday language to talk about position and distance • Recognise, create and describe patterns ***Earlier milestones:*** ***30-50 months*** *Shows an interest in space by making arrangements with objects or playing with shapes Uses positional language.* ***40-60+ months*** *Can describe their relative position such as 'behind' or 'next to'.*	**Breadth of study end points:** • describe position, directions and movements, including whole, half, quarter and three-quarter turns ***Notes and Guidance:*** *Pupils use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, nearer, close and far, up and down, forwards and backwards, inside and outside.* *Pupils make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.*	**Breadth of study end points:** • 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 anti-clockwise) ***Notes and Guidance:*** *Pupils should work with patterns of shapes, including those in different orientations* *Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (e.g. pupils moving themselves in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).*	**Breadth of study end points:** • 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 ***Notes and Guidance:*** *Pupils draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of coordinates, e.g. (2, 5) including using coordinate-plotting ICT tools.*	**Breadth of study end points:** • 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. EXTEND TO: • describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes ***Notes and Guidance:*** *Pupils recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes.* *EXTENSION:* *Pupils draw and label a pair of axes in all four quadrants with equal scaling (using negative numbers).* *Pupils draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These may be expressed algebraically.*
KEY VOCABULARY – EYFS/Yr 1 (Acorns) - position, over, under, above, below, top, bottom, side, on, in, outside, inside, around, in front, behind, front, back, beside, next to, opposite, apart, between, middle, edge, corner, direction, left, right, up, down, forwards, backwards, sideways, across, next to, close, near, far, along, through, to from, towards, away from, movement, slide, roll, turn, stretch, bend, whole turn, half turn; **Yr 2-3 (Sycamore) -** underneath, centre, journey, quarter turn, three-quarter turn; **Yr 4-6 (Juniper) -** route, higher, lower, clockwise, anticlockwise, right angle, straight line; **LKS3 (Palm) -** compass point, north, south, east, west, N, S, E, W, horizontal, vertical, diagonal, angle … is a greater/smaller angle than…. , acute angle, obtuse angle; **UKS3 (Elm) -** north-east, north-west, south-east, south-wes, NE, NW, SE, SW, translate, translation, rotate, rotation, degree, reflection, ruler, set square, angle measurer, compass; **EXTEND TO -** coordinate, protractor, reflex angle.				

Measurement - Outline (Intent)

INTENT of Measure: Our teaching of Measure **which informs our WALT** will enable pupils to develop the skills and knowledge to be fluent and confident in using and applying measure within a wide range of activities and settings which encourages them to:

- Problem solve and use measure within different contexts and situations
- Apply their skills and knowledge within everyday activities outside of the classroom setting and within the context of their adult life

WALT – EYFS will promote knowledge and understanding of:	**WALT - Key Stage 1 – 2** will continue to consolidate the skills achieved within EYFS and further promote knowledge and understanding to:	**WALT - Key Stage 3** will continue to consolidate the skills achieved within KS 1/2, develop pupil's fluency skills and further promote knowledge and understanding to:	**WALT – Key Stage 4** will continue to address the continued development of early maths skills via a more functional programme of learning delivered in wider contexts (classroom-based, school-based and community-based activities) which enables them to:	**WALT – Post 16** will continue to develop students' confidence in using maths which helps them become more independent in their daily adult lives (work experiences/ community engagement etc):
• describing and comparing different quantities such as length, mass, capacity/ volume, time and money • describe measures	• use everyday language to talk about size, weight, capacity, position, distance, time and money • compare quantities and objects and to solve problems • practice/use/apply skills to aid fluency • read and spell mathematical vocabulary, at a level consistent with their reading/ spelling skills/ knowledge	• use measuring instruments with accuracy • compare measures • make connections between measure and number • show precision and fluency in their work • solve problems involving measures • read and spell mathematical vocabulary correctly using their growing word reading and spelling knowledge	• use and apply their developing mathematical skills in a range of contexts and for various purposes via cross curricular links • apply and transfer skills building upon skills already acquired	• understand a situation and choose an approach to tackle the problem • formulate a model using mathematics • use mathematics to provide answers • interpret and check the results • evaluate the model and approach • explain the analysis and results • apply and adapt this experience in other situations as they arise

Maths Scheme of Work - Measurement: Money and Time

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • use everyday language to talk about time and money to compare quantities and objects and to solve problems • Recognise, create and describe patterns. ***Earlier milestones:*** ***22-36 months*** *Understands some talk about immediate past and future (e.g. before, later, soon).* *Anticipates specific time-based events such as mealtimes or home time.* ***40-60+ months*** *Beginning to use everyday language related to money.* *Uses everyday language related to time.* *Orders and sequences familiar events.* *Measures short periods of time in simple ways.*	**Breadth of study end points:** • Recognise and know the value of different denominations of coins and notes • Compare, describe and solve practical problems for: time (e.g. quicker, slower, earlier, later) • Measure and begin to record time (hours, minutes, seconds) • Sequence events in chronological order using language (e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening) • Recognise and use language related 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 ***Notes and Guidance:*** *Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past*	**Breadth of study end points:** • 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 amount 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 ***Notes and Guidance:*** *Pupils become fluent in counting and recognizing coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.* *They become fluent in telling the time on analogue clocks and recording it.*	**Breadth of study end points:** • 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, hours, o'clock: use vocabulary such as 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 ***Notes and Guidance:*** *Pupils continue to become fluent in recognizing the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. They record £ and p separately. The decimal recording of money is introduced normally in Yr 4 (Upper KS3).* *Pupils use both analogue and digital 12-hour clocks and record their times. In his way they become fluent and prepared for using digital 24-hour clocks in Yr 4 (Upper KS3).*	**Breadth of study end points:** • Estimate, compare and calculate different measures, including money in pounds and pence • convert between different units of measure (e.g hour to minute) • Read, write and convert time between analogue and digital 12- and 24-hour clocks • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days EXTEND TO: • Solve problems involving converting between units of time • Use all four operations to solve problems including money, using decimal notation, including scaling ***Notes and Guidance:*** *Pupils build on their understanding of place value and decimal notation to record metric measures, including money.* *They use multiplication to convert from larger to smaller units (e.g. money).* *Pupils use all four operations in problems involving time and money, including conversions (e.g. days to week, expressing the answer as weeks and days).*

KEY VOCABULARY MONEY – EYFS/Yr 1 (Acorns) - money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay; **Yr 2-3(Sycamore) -** change, dear, costs more, cheap, costs less, cheaper, how much ..?, how many ?, total; **Yr 4-6 (Juniper) -** bought, sold; **EXTEND TO -** discount, currency, profit and loss.

KEY VOCABULARY TIME - EFS/Yr 1 (Acorns) - time, days of the week, Monday, Tuesday ….., day, week, birthday, holiday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, quickly, slow, slower, slowest, slowly, old, older, oldest, new, newer, newest, takes longer, takes less time, hour, o'clock, clock, watch, hands; **Yr 2-3 (Sycamore) -** months of the year (January, February …), seasons: spring, summer, autumn, winter, weekend, month, year, earlier, later, first, midnight, date, how long ago?, how long will it be to …?, how long will it take to …?, how often, always, never, often, sometimes, usually, once, twice, half past, quarter past, quarter to, clock face, hour hand, minute hand, hours, minutes; **Yr 4-6 (Juniper) -** 5, 10, 15 minutes past, digital/analogue clock/watch, timer, seconds; **LKS3 (Palm) -** century, calendar, earliest, latest, a.m., p.m., Roman numerals, 12-hour clock time, 24-hour clock time; **UKS3 (Elm) -** leap year, millennium, noon, date of birth, timetable, arrive, depart; **EXTEND TO -** Greenwich Mean Time, British Summer Time; International Date Line.

Maths Scheme of Work - Measurement: Length, height, mass/weight, temperature and volume/capacity

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
Breadth of study end points: • use everyday language to talk about size, weight, capacity and distance to compare quantities and objects and to solve problems ***Earlier milestones:*** ***40-60+ months*** *Orders two or three items by length or height.* *Orders two items by weight or capacity.*	**Breadth of study end points:** • compare, describe and solve practical problems for: - lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half) - mass/weight (e.g. heavy/light, heavier than, lighter than) - capacity and volume (e.g. full/empty, more than, less than, half, half full, quarter) • measure and begin to record the following: - lengths and heights - mass/weight - capacity and volume ***Notes and Guidance:*** *The pairs of terms: mass and weight, volume and capacity, are used interchangeably at this stage.* *Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (e.g. counting) and continuous (e.g. liquid) measurement, to using manageable common standard units.* *In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers.*	**Breadth of study end points:** • 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 = ***Notes and Guidance:*** *Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations.* *Comparing measures includes simple multiples such as 'half as high'; 'twice as wide'.*	**Breadth of study end points:** • measure, compare, add and subtract: lengths (mm/cm/m); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2D shapes (see also geometry) ***Notes and Guidance:*** *Pupils continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (e.g. 1kg and 200 g) and simple equivalents of mixed units (for example 5m=500cm).* *The comparison of measures includes simple scaling by integers (e.g. a given quantity or measure is twice as long or five times as high) and this connects to multiplication.*	**Breadth of study end points:** • convert between different units of measure (e.g. kilometre to metre) • measure and calculate the perimeter of a rectilinear figures (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures EXTEND TO: • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds, miles • measure and calculate the perimeter of composite rectilinear shapes in cm and m • calculate and compare the area of rectangles (including squares) and including standard units, square centimetres (cm^2) and square metre (m^2) and estimate the area of irregular shapes • calculate the area of parallelograms and triangles • recognise that shapes with the same areas can have different perimeters and vice versa • estimate volume (e.g. using $1cm^3$ blocks to build cuboids (including cubes) and capacity (e.g. using water) • calculate, estimate and compare volume of cubes and cuboids using standard units • use all 4 operations to solve problems involving measures (e.g. length, mass, volume), including scaling (and conversion of units up to 3 decimal places) • use, read, write and convert between standard units, converting measurements of length, mass, volume and time using decimal notation to up to 3 decimal places ***Notes and Guidance:*** *Pupils build on their understanding of place value and decimal notation to record metric measures.* *They use multiplication to convert from larger to smaller units.* *Perimeter can be expressed algebraically as 2(a+b) where a and b are the dimensions in the same unit.* *They relate area to arrays and multiplication.* *EXTEND TO:* *Pupils use their knowledge of place value and multiplication and division to convert between standard units* *Pupils calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths.* *Pupils calculate the area from scale drawings using given measurements.* *Know approximate conversions and are able to tell if an answer is sensible.* *Using number line, pupils use, add and subtract positive and negative integers for measures such as temperature.*

KEY VOCABULARY GENERAL – EYFS/Yr 1 (Acorns) - measure, size, compare, guess, estimate, enough, not enough, too much, too little, too many, too few, nearly, close to, about the same as, just over, just under; **Yr 2-3 (Sycamore) -** measurement, roughly; **Yr 4-6 (Juniper) -** measuring scale; **LKS3 (Palm) -** division, approximately; **UKS3 (Elm)** - unit, standard unit, metric unit; **EXTEND TO -** imperial unit.
KEY VOCABULARY LENGTH - EYFS/Yr1 (Acorns) - metre, length, height, width, depth, long, short, tall, high, low, wide, narrow, thick, thin, longer, shorter, taller, higher … and so on, longest, shortest, tallest, highest … and so on, far, near, close; **Yr 2-3 (Sycamore) -** centimetre, ruler, metre stick; **Yr 4-6 (Juniper) -** further, furthest, tape measure; **LKS3 (Palm) -** millimetre; kilometre, mile, distance apart/between/to/from, perimeter; **UKS3 (Elm)** - breadth, edge, area, covers, square centimetre (cm^2); **EXTEND TO -** square metre (m^2), square millimetre (mm^2), yard, foot, feet, inch, inches, circumference.
KEY VOCABULARY WEIGHT/MASS - EYFS/Yr1 (Acorns) - weight, weighs, balances, heavy, light, heavier than, lighter than, heaviest, lightest, scales; **Yr 2-3 (Sycamore) -** kilogram, half kilogram; **Yr 4-6 (Juniper) -** gram; **UKS3 (Elm)** - mass: big, bigger, small, smaller; weight: heavy/light, heavier/lighter, heaviest/lightest; **EXTEND TO -** tonne, pound, ounce.
KEY VOCABULARY CAPACITY/VOLUME - EYFS/Yr1 (Acorns) - full, empty, half full, holds, container; **Yr 2-3 (Sycamore) -** litre, half litre, capacity, volume, more than, less than, quarter full; **Yr 4-6 (Juniper) -** millilitre, contains; **UKS3 (Elm)** - measuring cylinder; **EXTEND TO -** pint, gallon, centiletre, cubic centimetres (cm^3), cubic metres (m^3), cubic millilitres (ml^3), cubic kilometres (km^3).
KEY VOCABULARY TEMPERATURE - Yr 4-6 (Juniper) - temperature, degree; **LKS3 (Palm) -** centigrade.

Maths Scheme of work – Statistics

Early Learning Goals & Yr1 - Mathematics	Year 2 - 3 (KS1 and Lower KS2)	Years 4 - 6 (Upper KS2)	Years 7-8 (Lower KS3)	Years 8-9 (Upper KS3)
n/a	**n/a**	**Breadth of study end points:** • 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 ***Notes and Guidance:*** *Pupils record, interpret, collate, organise and compare information (e.g. using many-to-one correspondence in pictograms with simple ration 2, 5, 10)*	**Breadth of study end points:** • interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions (e.g. 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables ***Notes and Guidance:*** *Pupils understand and use simple scales (e.g. 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy.* *They continue to interpret data presented in many contexts.*	**Breadth of study end points:** • 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 EXTEND TO: • solve comparison, sum and difference problems using information presented on a line graph • complete, read and interpret information in tables, including timetables. • Interpret and construct pie charts and line graphs and use these to solve problems • Calculate and interpret the mean as an average ***Notes and Guidance:*** *Pupils understand and use a greater range of scales in their representations.* *Pupils begin to relate the graphical representation of data to recording change over time.* *EXTENSION:* *Pupils connect their work on coordinates and scales to their interpretation of time graphs.* *They begin to decide which representations of data are most appropriate and why.* *Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts.* *Pupils both encounter and draw graphs relating to two variables, arising from their own enquiry and in other subjects.*
KEY VOCABULARY – EYFS/Yr 1 (Acorns) - count, sort, group, set, list; **Yr 2-3 (Sycamore) -** vote, table; **Yr 4-6 (Juniper) -** tally, graph, block graph, pictogram, represent, label, title, most popular, most common, least popular, least common; **LKS3 (Palm) -** chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram; **UKS3 (Elm) -** survey, questionnaire, data; **EXTEND TO -** database, bar line chart, line graph, maximum/minimum value, outcome, pie chart, mean (mode, median, range as estimates for this), statistics, distribution.				