Map of the Maths Curriculum

What are the Knowledge, Skills and Understanding we want our pupils to gain?

NR, September 2022

Intent of our Mathematics curriculum – with Reasoning being one of the four pillars of the Pensford Curriculum, we aim to embed the necessary mathematical and the problem-solving skills that every child needs to prepare them for the everyday world and their future opportunities. We would like our children to have a sense of wonder about the mathematical world and an understanding of the critical skills needed in the connected areas of science, technology and engineering. Deeper thinking will be fostered with focussed recall questioning and developing the procedural fluency critical to mathematical proficiency. This will be supported through planning with the White Rose Scheme of Work, maths meetings (focussing on Key Instant Recall Facts from current and previous Threshold Concepts) and drawing upon mathematical and problem-solving language throughout our wider curriculum.

Maths progress will be measured through Early Learning Age/Stage Band tracking, Y1-Y5 NfER test framework, and Y2/ Y6 SAT test framework.

Include *context*.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
EYFS ***** **WRMH**	**Topic – Time to Wonder** **Number** ***(Just Like Me)*** Match and Sort Compare Amounts ***(It's Me 1 2 3!)*** Representing 1, 2 & 3	**Topic – Time to Wonder** **Number** ***(It's Me 1 2 3!)*** Composition of 1, 2 & 3 ***(Light and Dark)***	**Topic – Me and my world** **Number** ***(Growing 6, 7 & 8)*** 6, 7 & 8 Combining 2 amounts Making Pairs ***(Building 9 & 10)***	**Topic – Me and my world** **Number** ***(To 20 and Beyond)*** Building Numbers Beyond 10 Counting Patterns Beyond 10 (Consolidate)	**Topic – Out and About** **Number** ***(First Then Now)*** Adding More Taking Away ***(Find My Pattern)*** Doubling	**Topic – Out and About** **Number** ***(Find My Pattern)*** Even & Odd ***(On the Move)*** Deepening Understanding

	Comparing 1, 2 & 3 **Measure Shape and Spatial Thinking** ***(Just Like Me)*** Compare Size, Mass & Capacity Explore Pattern ***(It's Me 1 2 3!)*** Circles and Triangles	Representing Numbers to 5 One More and Less ***(Alive in 5)*** Introducing zero Comparing numbers to 5 Composition of 4 & 5 **Measure Shape and Spatial Thinking** ***(It's Me 1 2 3!)*** Positional Language ***(Light and Dark)*** Shapes with 4 sides Time ***(Alive in 5)*** Compare Mass Compare Capacity	Counting to 9 & 10 Comparing numbers to 10 Bonds to 10 **Measure Shape and Spatial Thinking** ***(Growing 6, 7 & 8)*** Length & Height Time	**Measure, Shape and Spatial Thinking** ***(Building 9 & 10)*** 3D-shapes Patterns ***(To 20 and Beyond)*** Spatial Reasoning Match, Rotate, Manipulate (Consolidate)	Sharing and Grouping **Spatial Thinking** ***(First Then Now)*** Spatial Reasoning Compose and Decompose	Patterns and Relationships **Spatial Thinking** ***(Find My Pattern)*** Spatial Reasoning Visualise and Build ***(On the Move)*** Spatial Reasoning Mapping
Year 1	**Topic – Who's coming to tea?** **Topic Our amazing world** **Place Value** Sort, count and represent objects. Numbers to 20	**Topic – Fire** **Topic Toys** **Addition and subtraction** Add by counting on using a number line. Subtraction by counting back, using a	**Topic- How do I got to…?** **Topic We are artists** **Division** Make equal groups by sharing and grouping. **Place value**	**Topic- Where are all the wild things?** **Topic Maps and routes** **Shape** Recognise and name 2d shapes.	**Topic- Once upon a time** **Topic Seasonal changes /weather**	**Place value recap** **Recap four operations**

	Count, read and write numbers forwards and backwards. One more/One less Represent numbers as tens and ones Order numbers **Addition and subtraction** Part- whole model Addition symbol Subtraction symbol Fact families Number bonds within 10. Number bonds to 10	number line, crossing and not crossing 10. Subtraction- finding the difference Compare calculations using > < = signs. **Money** Recognise coins and recognise notes. **Place value** Numbers to 50 Representing numbers as tens and ones One more/One less Compare numbers within 50 Order numbers within 50 **Multiplication** Count in 2s, 5s and 10s Count coins Make and add equal groups Make arrays Doubles	Numbers to 100 Counting to 100. Partitioning numbers to 100 Comparing numbers Ordering numbers One more/One less **Length and height** Measure length Compare height and length	Recognise and name 3d shapes Sort 2d shapes Sort 3d shapes Make patterns with 2d and 3d shapes. **Fractions** Find half Find quarters	**Geometry – position and direction** **Measure – time** **Measure – weight and capacity**	
Year 2	**Topic – Who's coming to tea?** **Topic Our amazing world**	**Topic – Fire** **Topic Toys**	**Topic- How do I got to…?** **Topic We are artists**	**Topic- Where are all the wild things?**	**Topic- Once upon a time**	**Problem solving** **Consolidation and investigation**

	Place Value Count forwards and backwards to 100. Represent numbers to 100. Partition numbers into tens and ones. Represent numbers in part-whole and place value chart. Compare numbers using > < = signs Order numbers in ascending and descending order **Addition and subtraction** Add and subtract 1s, 10more and 10 less and multiplies of 10. Add three 1 digit numbers. Add and subtract 2 2digit numbers (including an exchange) Number bonds to 100 (tens and tens/ones)	**Addition and subtraction** Add and subtract 2 2digit numbers (including an exchange) Compare calculations > < = signs. 1 step and 2 step addition and subtraction problems. **Money** Recognise coins and recognise notes. Count coins Find the total of money 2 step problems money **Multiplication** Counting in multiples -Count in 2s, 5s, 10 and 3s Count money in p and £ Recognise, make and add equal groups. Use arrays 2s, 5s and 10 times tables.	**Division** Make equal groups by sharing and grouping. Divide by 2 Divide by 5 and 10 Odd and even numbers **Statistics** Make tally charts Draw pictograms Draw block diagrams Interpret diagrams Apply counting in multiplies to interpret graphs. **Length and height** Measure length Compare height and length cm and m Four operations with length	**Topic Maps and routes** **Shape** Name 2d and 3d shapes Describe 2d shapes using sides and vertices. Lines of symmetry Count faces, edges and vertices of 3d shapes Sort 2d and 3d shapes **Fractions** Recognise and find half Recognise and find quarters Recognise and find thirds Unit fractions Non- unit fractions Equivalent fractions ½ and 2/4 Find ¾	**Topic Seasonal changes /weather** **Geometry – position and direction** **Measure – time** **Measure – weight and capacity**	

Year 3	**Topic - Going Global and North, East, South and West** **Place Value** Hundreds Count in 50s Represent numbers to 1000 Recognise each digit in a 3 digit number Number line to 1000 Find 1. 10, 100 more or less than a given number Compare objects and numbers Order numbers **Addition and Subtraction** To add and subtract numbers mentally, including HTO+O, HTO+T and HT0+H Add and subtract with up to 3 digits using the formal written method	**Topic – Raiders and Traders and Extreme Survival** **Multiplication and Division** Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables To compare statements Multiply 2 digits by 1 digit using written methods Divide 2 digits by 1 digit Scaling	**Topic – Walk Like an Egyptian and Rise of the Robots** **Measurement: Length, Perimeter and Area** Measure lengths Equivalent lengths (mm and cm, m and cm) Comparing lengths Add and subtract lengths Measure perimeter Calculate perimeter	**Topic – Who is Roaming in the Rainforest? Down in the Valley** **Fractions** Recognise unit and non-unit fractions Make the whole Fractions on a number line Equivalent fractions Compare and order fractions To find fractions of an amount Add and subtract fractions Tenths Count in tenths Tenths as decimals **Measurement: Mass and Capacity** Measure mass (g and kg) Compare mass	**Topic – Dig for Victory and Snap, Crackle and Pop** **Measurement: Money** Pounds and pence Converting pounds and pence Adding and subtracting money Giving change **Measurement: Time** Months of the year Hours in a day Telling the time to the nearest 5 minutes Telling the time to the nearest minute AM and PM 24 hour clock Finding the duration Comparing the duration	**Topic – Dig for Victory and Escape for Pompeii** **Statistics** Pictograms Bar charts Tables **Geometry: Properties of Shapes** Turns and angles Right angles in shapes Compare angles Draw accurately Horizontal and vertical Parallel and perpendicular Recognise and describe 2D and 3D shapes Make 3D shapes

	(column addition/subtraction) Estimate the answer to a calculation Use the inverse operation to check answers Solve problems including missing number problems, using number facts, place value and more complex addition and subtraction			Add and subtract mass Measure capacity (ml and l) Compare capacity Add and subtract capacity	Finding the start and end time	
Year 4	**Topic - Going Global and North, East, South and West** **Place Value** Roman numerals to 100 Count in 25s and 1000s Represent numbers to 10000	**Topic – Raiders and Traders and Extreme Survival** **Multiplication and Division** Recall multiplication and division facts for multiplication tables up to 12 × 12 Multiplying and dividing by 10, 100, 1 and 0	**Topic – Walk Like an Egyptian and Rise of the Robots** **Measurement: Length, Perimeter and Area** Kilometres Perimeter on a grid Perimeter of a rectangle	**Topic – Who is Roaming in the Rainforest? Down in the Valley** **Fractions** Fractions greater than 1 Count in fractions Equivalent fractions Calculate fractions of a quantity	**Topic – Dig for Victory and Snap, Crackle and Pop** **Measurement: Money** Pounds and pence Ordering amounts of money Rounding to estimate amounts	**Topic – Dig for Victory and Escape for Pompeii** **Statistics** Interpret charts Comparison, sum and difference Line graphs

	Partitioning numbers Number line to 10000 Find 1000 more or less than a given number Round to the nearest 10, 100 and 1000 Compare and order 4 digit numbers Negative numbers **Addition and Subtraction** Add and subtract with up to 4 digits using the formal written method (column addition/subtraction) Estimate the answer to a calculation Use the inverse operation to check answers Solve addition and subtraction two step problems in	Factor pairs Multiply 2 and 3 digits by 1 digit using written methods Divide 2 and 3 digits by 1 digit	Perimeter of rectilinear shapes Finding area by counting squares Make rectilinear shapes using a given number of squares Comparing area	Problem solving- calculate quantities Add two or more fractions Subtract 2 fractions Subtract from whole amounts **Decimals** Recognise tenths and hundredths Tenths as a decimal Tenths on a place value grid Tenths on a number line Divide 1 digit by 1 Divide 2 digits by 10 Hundredths as decimals Hundredths on a place value grid Divide 1 or 2 digits by 100 Write decimals Compare decimals Order decimals Round decimals Halves and quarters	Solve money problems using the four operations **Measurement: Time** Years, months, weeks and days Hours, minutes and seconds Analogue to digital – 12 hour Analogue to digital – 24 hour	**Geometry: Properties of Shapes** Identify angles Compare and order angles Triangles Quadrilaterals Lines of symmetry Complete a symmetric figure **Position and Direction** Introduced to co-ordinates – describe position Plot given points on a grid Move images/shapes on a grid

	contexts, deciding which operations and methods to use and why					
Year 5	**Topic- Mmm chocolate and what's out there?** **Place Value** Numbers to a million Roman Numerals to 1000 Round numbers to 1 million Compare and order numbers to 1 million Counting in 10s,100s, 1,000s, 10,000s and 100,000s Negative numbers Multiply and divide whole numbers and decimals by 10,100 and 1,000	**Topic- Why aorta keep fit? And Who let the gods out?** **Multiplication and Division** Divide 4 digit by 1 digit Divide with remainders Multiples Factors Common factors Prime numbers Square numbers Cube numbers **Fractions** Equivalent fractions Improper fractions to mixed numbers Mixed numbers to improper fractions Number sequences	**Topic- Marvellous Mayans and Is it me or is it hot in here?** **Percentages** Divide 4 digit by 1 digit Understand percentages Percentages as fractions and decimals Equivalent F.D.P **Measurement: Conversion of units** Kilograms and kilometres Milligrams and millilitres Metric units Imperial units	**Topic- Were we a fish and victorious Victorians** **Geometry: Properties of Shapes** .Measuring angles in degrees Measuring with a protractor Drawing lines and angles accurately Calculating angles on a straight line and around a point Calculating lengths and angles in shapes Regular and irregular polygons Reasoning about 3-D shapes **Decimals**	**Dragon's Den and how steady is your hand?** **Geometry: Position and Direction** Position in the first quadrant Reflection Reflection with co-ordinates Translation Translation with co-ordinates **Fractions** Addition and subtraction with fractions Converting mixed and improper fractions	**Dragon's Den and how steady is your hand?** **Consolidate any areas of maths that the cohort aren't confident in**

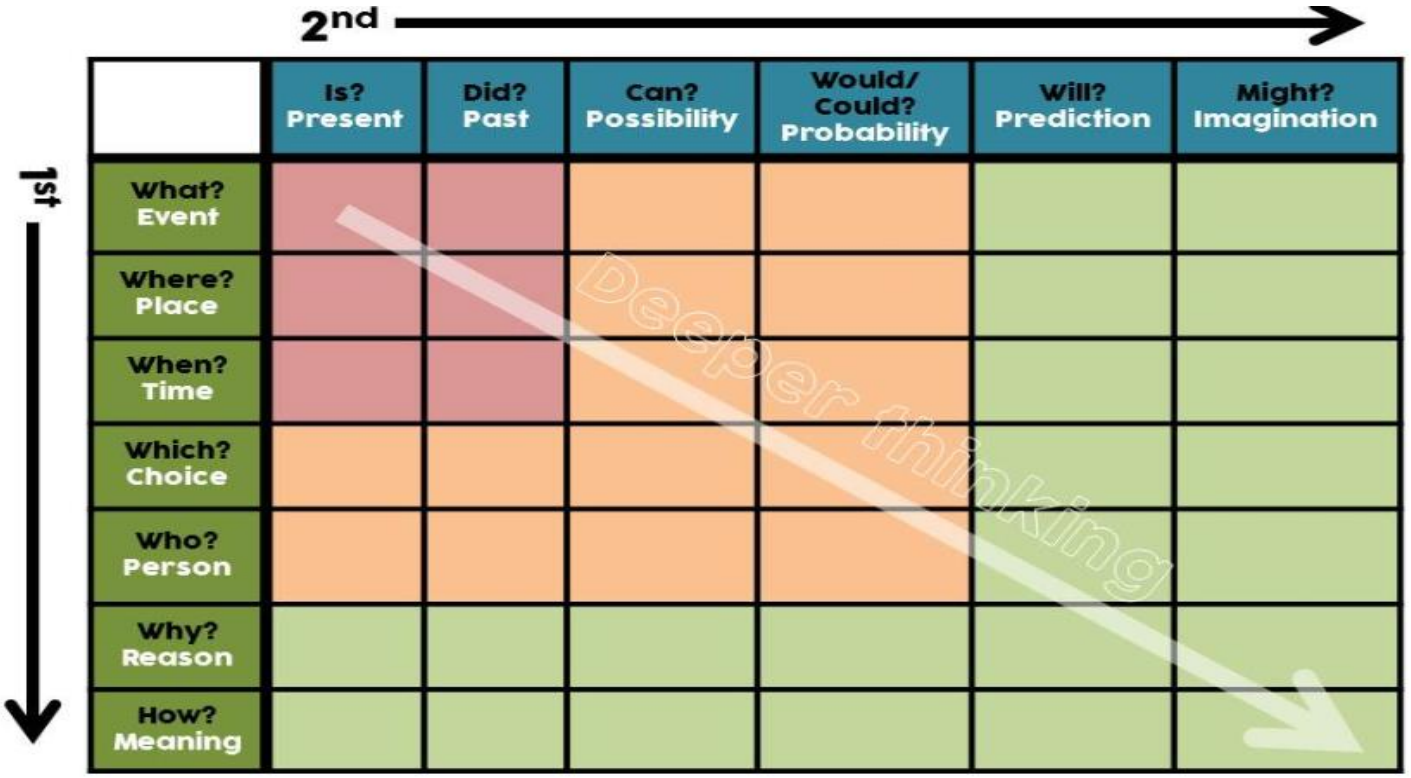
	Addition and Subtraction Add and subtract whole numbers with numbers more than 4 digits (column method) Round to estimate and approximate Inverse addition and subtraction Multi-step addition and subtraction Multiply and divide by 10,100 and 1,000 Adding and subtracting decimals with the same and different number of decimals **Multiplication and Division** Multiply up to 4 digit by 2 digit Divide 4 digit by 1 digit Divide with remainders	Compare and order fractions Add and subtract fractions Subtract fractions Subtract mixed numbers	Converting units of time Timetable **Measurement: Perimeter and Area** Measure perimeter Calculate perimeter Area of rectangles Area of compound shapes Area of irregular shapes **Measurement: Volume** What is volume? Compare volume Estimate volume Estimate capacity	Decimals up to 2 d.p. Decimals as fractions Understand thousandths Thousandths as decimals Rounding decimals Order and compare decimals **Statistics** Read and interpret line graphs Draw line graphs Use line graphs to solve problems Timetables		

Year 6	**Topic- Mmm chocolate and what's out there?** **Place Value** Numbers to ten million Compare and order any number Round any number Negative numbers Roman Numerals up to 3000 Multiply and divide any number (including decimals) by 10,100 and 1,000 **Four operations** Add and subtract integers Multiply 4 digit by 2 digit Multiply up to 2 decimal places Short division Divide using factors	**Topic- Why aorta keep fit? And Who let the gods out?** **Four operations** Long division Order of operations Prime numbers to 100 Square and cube numbers Common factors Common multiples **Fractions** Equivalent fractions Simplify fractions Compare and order fractions Add fractions Subtract fractions Multiply fractions Divide fractions Four rules with fractions Inverse of the four operations with fractions Fractions of an amount	**Topic- Marvellous Mayans and Is it me or is it hot in here?** **Percentages** Fractions to percentages Equivalent FDP Order FDP Percentage of an amount Percentages missing values **Measurement- conversion of units** Metric measures Convert metric measures Calculate with metric measures Miles and kilometres Imperial Measures Reading, interpreting a timetable	**Topic- Were we a fish and victorious Victorians** **Geometry: Position and Direction** The first quadrant Four quadrants Translations Reflections **Geometry: Properties of Shapes** Measure with a protractor Calculate angles Vertically opposite angles Angles in a triangle Angles in quadrilateral Angles in regular polygons Draw shapes accurately Draw nets of 3-D shapes	**Dragon's Den and how steady is your hand?** **Consolidate any areas of maths that the cohort need to work on before SATs**	**Dragon's Den and how steady is your hand?** **Post SATs investigations**

		Inverse of fractions of amounts Sequencing fractions	Converting time **Measurement: Perimeter, Area & Volume** Shapes- same area Area and perimeter Area of a triangle Area of parallelogram Volume of a cuboid	**Algebra** Finding rules Forming expressions Substitution Formulae Forming equations Find pairs of values Enumerate possibilities **Ratio** Ratio and fractions Calculating ratio Using and calculating scale factors Ratio and proportion problems **Statistics** Read and interpret line graphs Draw line graphs Circles Draw, read and interpret pie charts Pie charts with percentages The mean		
Threshold Concepts		**KS1**		**LKS2**		**UKS2**

	Examples of Deeper Questioning related to Threshold Concepts		
Place Value			
Addition and Subtraction			
Shape			
Measuring			
Multiplication and Division			
Fractions			
Position and Direction			
Statistics			
Algebra			

Deeper Questioning Grid



- Recall Questioning should always be secure at the earlier levels before moving on to the deeper levels of questioning.
- Whilst the questioning above gives examples of how the questioning can move on through Key Stages, they should not be limited by nor planned for, purely by age and stage.
- Questioning should be matched to the child's ability to demonstrate secure knowledge and understanding in the earlier stages of recall.

Threshold Concepts Ref: Meyer and Land (2006)

- **Transformative –** it changes the way you see the world,
- **Troublesome –** it might seem counterintuitive or alien,
- **Irreversible –** the transformative nature means that once it is learnt it is unlikely to be forgotten,
- **Intergrated –** it reveals connections between the different parts of the disciple,
- **Bounded –** despite this, the concept has defined parameters in which it applies,
- **Discursive –** it leads to the development of new language.

The implications of using Threshold Concepts Ref: Mark Enser 2017 'Teaching it Real'

- Use it to help structure our program of study. Geography is based on the idea of a spiral curriculum. We can make sure that Threshold concepts are taught well and taught early.
- Use it when planning a sequence of learning. Are you introducing these threshold concepts at the start of the topic?
- Plan to test these concepts. We need to make sure that pupils are secure in this threshold knowledge before moving on.
- Close the gaps. If pupils haven't grasped these threshold concepts there is no point in moving on regardless. We need to have work for them to help them fill in these gaps.
- Revisit often. We need to plan to link new information back to these Threshold concepts and show the links between different parts of the discipline. Use "Powerful Geography" to give them the change to apply these parts of the subject.

TEACHERS TO ACTION
On the Mathematics Curriculum Map: As topics are taught – teachers can insert the recall questions to ensure our Maths Curriculum Map matches the planning, and that the planning sequence is securing essential concepts (irreversible knowledge). In Lessons: Teachers must ensure a rich mathematical vocabulary is taught and developed throughout the sequencing of teaching. Teachers must ensure that threshold concepts are secure within a level before moving onto a deeper level of questioning/ thinking. This should be supported through our Maths Meetings which are used to support previous maths topics are revisited and concepts recalled.