

## **Curzon Maths Curriculum June 2020**

### **Curzon specific aims of Maths-our intent**

We believe that everyone can “do” Maths. Our curriculum for Maths promotes resilience, enquiry and curiosity and the enjoyment of mathematics. We promote our Curzon value of courage and for pupils to have a “growth mindset” as an essential approach to learning in Maths. This is because we have observed that a lot of our pupils are anxious about maths and tend to panic when faced with less familiar word problems.

Curzon follows a mastery curriculum where concepts will be taught using concrete, visual and abstract strategies and in small, clearly sequenced steps. Concrete and visual strategies are used in all year groups as temporary scaffolds – tools for helping children solve problems. Pupils will learn to “master” key areas of Maths such as: representation and structure, mathematical thinking and variation and fluency. Our teaching of Mathematics is not limited to a “discreet” maths lesson as it is a vital part of our Science and Cookery teaching and is used to enhance all of our curriculum for example line graphs to represent the outcomes of experiments of time or weight and measurement in Cookery.

Children in all classes will work on deepening their learning through activities, including: reasoning and problem questions, bar modelling, word problems and explaining misconceptions or errors. We follow the White Rose schemes of learning but we adapt them to fit the needs of our pupils. White Rose organises teaching into 2-3 week blocks allowing the children to learn each concept in depth. However, there is a danger that this means that children only work on certain areas once a year. We ensure that we include a revision of key areas in our maths warm ups and plan to ensure a constant reinforcement of knowledge and skills so that knowledge becomes “sticky”. We formally assess the children termly on the concepts that they have had the opportunities to master and use findings from these assessments to plan future warmups and shape our teaching of the next units.

### **How the curriculum is tailored to our pupils- our implementation**

We have identified areas where our pupils have historically achieved lower attainment and tailor our curriculum to meet that need. Good examples of this are the bespoke fractions policy or our times tables schemes that are used as part of our provision. We place an emphasis on maths vocabulary and explaining skills.

We believe that a secure knowledge of the times tables is essential to be a mathematician, therefore all of the children from Key Stage 1 take part in a times tables scheme that helps them to have quick and accurate recall of the times tables. Once a week there is a dedicated times tables session and the children work through three levels for each times table and they are rewarded for their successes and effort.

### Early Years and Foundation Stage:

The majority of pupils enter on 30-50 D (below national average). Extra time is spent during this phase to allow children to master essential skills such as one to one correspondence or recognition of shapes. At this stage a lot of Maths is taught through child initiated learning and the use of physical resources that help to stimulate interest and an early love of Maths.

### Key Stage 1:

In Key Stage 1, children are taught the mental strategies required to begin to master the four operations of calculation. They begin to gain fluency and start to develop their reasoning skills. Pupils learn how numbers and operations have closely linked relationships and they explore inverse operations and number patterns.

### Key Stage 2

By the end of Key Stage 2, children become confident mathematicians. They have secure mental and written methods of calculation and they can apply these in a range of different contexts. They can explain their reasons to a solution or explain misconceptions using appropriate vocabulary.

Below are the schemes of learning that we follow to ensure our curriculum covers the National Curriculum for Mathematics.

Further detail about progression in number methods and fractions is to be found in our fractions and calculations policies.

## Curzon Long Term Curriculum Planning for Maths

### Early Years Foundation Stage children learn to:

- Count confidently up to 10
- Develop a deep understanding of the numbers to 10 and the relationships between them and the patterns within those numbers including even and odds and how quantities can be distributed evenly
- Subitise (recognise quantities without counting) up to 5
- Automatically recall number bonds to 5 (including subtraction facts) and some number bonds to 10, including double facts
- Verbally count beyond 20
- Compare quantities up to 10 in different contexts (greater than, less than, same as)
- Develop spatial reasoning skills
- Develop positive have a go attitudes and interests in Maths without worrying about making mistakes
- Look for patterns and relationships
- Spot connections

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Getting to know you (Take this time to play and get to know the children!)			Just like me!			It's me 1, 2, 3!			Light and Dark		
Spring	Alive in 5!			Growing 6, 7, 8			Building 9 and 10			Consolidation		
Summer	To 20 and Beyond			First, then, now			Find My Pattern			On the Move		

## In Year 1 the children will learn to:

- Count within 100, forwards and backwards, starting with any number.
- Reason about the location of numbers to 20 within the linear number system, including comparing using  $<$   $>$  and  $=$
- Develop fluency in addition and subtraction facts within 10.
- Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.
- Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers
- Read, write and interpret equations containing addition ( + ), subtraction ( - ) and equals ( = ) symbols, and relate additive expressions and equations to real-life contexts.
- Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.
- Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value (within 10)			Number: Addition and Subtraction (within 10)				Geometry: Shape	Number: Place Value (within 20)		Consolidation	
Spring	Number: Addition and Subtraction (within 20)				Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Consolidation
Summer	Number: Multiplication and Division		Number: Fractions		Geometry: Position and Direction	Number: Place Value (within 100)		Measurement: Money	Measurement: Time		Consolidation	

## In Year 2 children will learn to:

- Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and nonstandard partitioning.
- Reason about the location of any two digit number in the linear number system, including identifying the previous and next multiple of 10.
- Secure fluency in addition and subtraction facts within 10, through continued practice.
- Add and subtract across 10.
- Recognise the subtraction structure of ‘difference’ and answer questions of the form, “How many more...?”.
- Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two digit number.
- Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two digit numbers.
- Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.
- Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).
- Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value		Number: Addition and Subtraction					Measurement: Money		Number: Multiplication and Division		
Spring	Number: Multiplication and Division	Statistics		Geometry: Properties of Shape			Number: Fractions			Measurement: Length and Height	Consolidation	
Summer	Geometry: Position and Direction		Problem solving and efficient methods		Measurement: Time		Measurement: Mass, Capacity and Temperature			Investigations		

### In Year 3 children will learn to:

- Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three digit multiples of 10.
- Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.
- Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.
- Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).
- Calculate complements to 100.
- Add and subtract up to three-digit numbers using columnar methods, **particularly the expanded column method.**
- Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.
- Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.
- Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.
- Add and subtract fractions with the same denominator, within 1.
- Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.
- Draw polygons by joining marked points, and identify parallel and perpendicular sides.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition and Subtraction				Number: Multiplication and Division			Consolidation	
Spring	Number: Multiplication and Division			Measurement: Money	Statistics		Measurement: Length and Perimeter			Number: Fractions	Consolidation	
Summer	Number: Fractions			Measurement: Time			Geometry: Properties of Shape		Measurement: Mass and Capacity			Consolidation

**In Year 4 the children will learn to:**

- Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.
- Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.
- Understand and apply the distributive property of multiplication.
- Reason about the location of mixed numbers in the linear number system.
- Convert mixed numbers to improper fractions and vice versa.
- Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.
- Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.
- Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.
- Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value				Number: Addition and Subtraction			Measurement: Length and Perimeter	Number: Multiplication and Division			Consolidation
Spring	Number: Multiplication and Division		Measurement: Area	Number: Fractions				Number: Decimals			Consolidation	
Summer	Number: Decimals	Measurement: Money		Measurement: Time	Statistics		Geometry: Properties of Shape		Geometry: Position and Direction	Consolidation		

**In Year 5 children will learn to:**

- Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.
- Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.
- Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.
- Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.
- Find non-unit fractions of quantities.
- Find equivalent fractions and understand that they have the same value and the same position in the linear number system.
- Recall decimal fraction equivalents for  $\frac{1}{2}$  ,  $\frac{1}{4}$  ,  $\frac{1}{5}$  and  $\frac{1}{10}$ , and for multiples of these proper fractions.
- Compare angles, estimate and measure angles in degrees ( $^{\circ}$ ) and draw angles of a given size.
- Compare areas and calculate the area of rectangles (including squares) using standard units.

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Autumn	Number: Place Value		Number: Addition and Subtraction		Statistics		Number: Multiplication and Division		Measurement: Perimeter and Area		Consolidation	
Spring	Number: Multiplication and Division		Number: Fractions						Number: Decimals and Percentages		Consolidation	
Summer	Number: Decimals			Geometry: Properties of Shape		Geometry: Position and Direction	Measurement: Converting Units		Measurement: Volume	Consolidation		

**In Year 6 children will learn to:**

- Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000)
- Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning.
- Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.
- Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
- Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number)
- Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- Solve problems involving ratio relationships.
- Solve problems with 2 unknowns.
- Recognise when fractions can be simplified, and use common factors to simplify fractions.
- Express fractions in a common denomination and use this to compare fractions that are similar in value.
- Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value		Number: Addition, Subtraction, Multiplication and Division				Number: Fractions				Geometry: Position and Direction	Consolidation
Spring	Number: Decimals		Number: Percentages		Number: Algebra		Measurement: Converting Units	Measurement: Perimeter, Area and Volume		Number: Ratio		Consolidation
Summer	Geometry: Properties of Shape		Problem Solving			Statistics		Investigations				Consolidation

## Impact

By the time our children leave Curzon they will:

- show resilience when a question seems initially difficult
- have an excellent grasp of basic number skills and the confidence to try strategies out.
- be able to demonstrate excellence of understanding in every strand of the curriculum – as evidenced through analysis of KS2 data.
- make links between different areas of Maths and know how Maths is used in other curriculum areas
- be able to demonstrate a deep understanding of mathematics through their ability to investigate problems in novel ways, applying what they have learnt to a range of contexts. They are able to generate sound explanations for the patterns that they find.