



## Horbury Bridge Academy Mathematics Overview

### Curriculum Drivers

At Horbury Bridge Academy we want all our children to gain the experiences they need to thrive in today's ever changing global landscape. As a small school serving a local community, it is important for us to not only focus on our area and what makes us unique, but also to provide experiences for pupils beyond those available within our community in order for us to support them in becoming global citizens of the future. In order to achieve this, we have three core drivers that run through our curriculum and alongside our Christian vision. These drivers are used to shape the choices we make when planning and delivering learning experiences for our pupils.

Our vision:

***"Living by Our Christian Values: Together in Faith, Hope and Love"***

Our drivers:

- 1. Diversity**
- 2. Sustainability**
- 3. Enrichment**

### Mathematics Principles

Pupils should:

- ***Become fluent*** in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- ***Solve problems*** by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios.

- ***Reason mathematically*** by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.
- We believe that ability within Mathematics is not fixed. We are developing the mind-sets of children and adults alike to develop a Growth Mindset and a "WE CAN" attitude to Mathematics.
- Maths this year will foster positive attitudes, fascination and excitement of discovery through the teaching and learning of mathematical concepts
- broaden children's knowledge and understanding of how mathematics is used in the wider world by making rich and varied real life connections through links with the wider curriculum
- Our children will confidently reason about their mathematics, using a suitable range of mathematical language, recognising its importance for communication and deep thinking and will have a 'can do' attitude, especially when problem solving
- Teachers will foster children's independence by giving them the time to have a go, make mistakes and learn from them

## The Diamond Dash

The Diamond Dash is times table challenge that was designed by our staff to raise the profile of times tables across the academy in an exciting way. The expectation for each award has been matched to the Mathematics National Curriculum 2014. There are 8 levels available which should be taken on a 'stage not age' approach.

Children will ask to sit each test when they are confident and feel they are ready. Children need to practise their times tables as much as possible at home, including the use of Times Table Rock Stars, to prepare for the test. Apart from Topaz and Pearl Levels each test is timed.

At the end of each academic year, pupils who achieve their 'Gold' award compete in a Mastermind-like Grand Final, with the winner taking the title of Supreme Champion.

## CPA Approach

### **At Horbury Bridge Academy we follow the White Rose Maths Sequence and progression of learning.**

Children (and adults!) can find maths difficult because it is abstract. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving from concrete materials, to pictorial representations, to abstract symbols and problems.

#### **Concrete step**

Concrete is the "doing" stage. During this stage, students use concrete objects to model problems. Unlike traditional maths teaching methods where teachers demonstrate how to solve a problem, the CPA approach brings concepts to life by allowing children to experience and handle physical (concrete) objects. With the CPA framework, every abstract concept is first introduced using physical, interactive concrete materials.

For example, if a problem involves adding pieces of fruit, children can first handle actual fruit. From there, they can progress to handling abstract counters or cubes which represent the fruit.

### **Pictorial step**

Pictorial is the "seeing" stage. Here, visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.

Building or drawing a model makes it easier for children to grasp difficult abstract concepts (for example, fractions). Simply put, it helps students visualise abstract problems and make them more accessible.

### **Abstract step**

Abstract is the "symbolic" stage, where children use abstract symbols to model problems. Students will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves the teacher introducing abstract concepts (for example, mathematical symbols). Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols (for example,  $+$ ,  $-$ ,  $\times$ ,  $/$ ) to indicate addition, multiplication or division.

## **Mathematics Overview**

### **Maths in Early Years**

Teachers in the foundation stage follow the White Rose Maths Schemes of learning. The Early Years is a time for exploration and investigation in maths and the learning environment promotes mathematical thinking. Children develop their understanding through a rich variety of activities both self-selected and adult led. Adults encourage the children to explore, enjoy, learn, practise and talk about their developing understanding which they can use to solve problems, generate questions and make connections across other areas of learning.

### **Maths in Key Stage 1 (Years 1 and 2)**

In Years 1 and 2, the focus of Maths is to ensure the children develop confidence and mental fluency with whole numbers, counting and place value. This often involves working with numerals, words and the four operations ( $+$  -  $\times$   $\div$ ). The children should be precise in using and understanding place value and know number bonds to 20.

The children also develop their ability to recognise, describe, draw, compare and sort different shapes. The children will use a range of measures to describe and compare different quantities (such as length, mass, capacity/volume, time and money).

Our Y2 pupils are prepared for KS1 SATs

### **Maths in Lower Key Stage 2 (Years 3 and 4)**

In Years 3 and 4, the focus is to ensure the children become increasingly fluent with whole numbers and the four operations (including number facts and place value). Pupils begin to develop efficient written and mental calculations with increasingly large whole

numbers. They begin to develop their ability to solve a range of problems, including simple fractions and decimal place value. The children develop mathematical reasoning to help them analyse shapes and their properties and confidently describe their relationships.

By the end of Year 4, children should have memorised their multiplication tables up to and including the 12 times table and be able to show precision and fluency in their work.

Pupils in Year 4 are prepared for the Multiplication Tables Check (MTC).

### **Maths in our Upper Key Stage 2 (Years 5 and 6)**

In Years 5 and 6, the focus of Maths is to ensure that children extend their understanding of the number system and place value to include larger integers. Pupils should be able to make connections between multiplication and division with fractions, decimals, percentages and ratio. Children should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems that demand the use of efficient written and mental methods of calculation. Children are introduced to algebra as a means for solving a variety of problems.

The children's understanding and knowledge in geometry and measures consolidates and extends the knowledge they have developed in number; children should be able to classify shapes with increasingly complex geometric properties, using the vocabulary they need to describe them with accuracy and confidence.

Our Y6 pupils are prepared for KS2 SATs.

# Early Years

Early Years Foundation Stage			
Term	Autumn	Spring	Summer
Core Learning	<p><b>Just Like Me</b></p> <ul style="list-style-type: none"> <li>- Match and sort</li> <li>- Compare amounts</li> <li>- Compare size, mass and capacity</li> <li>- Explore Pattern</li> </ul> <p><b>It's Me 1 2 3!</b></p> <ul style="list-style-type: none"> <li>- Represent 1, 2 &amp; 3</li> <li>- Compare 1, 2 &amp; 3</li> <li>- Compose 1, 2 &amp; 3</li> <li>- Circles and triangles</li> <li>- Positional language</li> </ul> <p><b>Light and Dark</b></p> <ul style="list-style-type: none"> <li>- Represent numbers to 5</li> <li>- One more and less</li> <li>- Shapes with 4 sides</li> <li>- Time</li> </ul>	<p><b>Alive in 5!</b></p> <ul style="list-style-type: none"> <li>- Introducing 0</li> <li>- Compare numbers to 5</li> <li>- Compose numbers to 5</li> <li>- Compare mass cont.</li> <li>- Compare capacity cont.</li> </ul> <p><b>Growing 6 7 8</b></p> <ul style="list-style-type: none"> <li>- Introduce 6, 7 &amp; 8</li> <li>- Combine 2 amounts</li> <li>- Make pairs</li> <li>- Length and height</li> <li>- Time cont.</li> </ul> <p><b>Building 9 10</b></p> <ul style="list-style-type: none"> <li>- Counting to 9 &amp; 10</li> <li>- Comparing Numbers to 10</li> <li>- Bonds to 10</li> <li>- 3D-shapes</li> <li>- Spatial reasoning (1)</li> <li>- Patterns</li> </ul>	<p><b>To 20 and Beyond</b></p> <ul style="list-style-type: none"> <li>- Building Numbers beyond 10</li> <li>- Counting patterns beyond 10</li> </ul> <p><b>First Then Now</b></p> <ul style="list-style-type: none"> <li>- Adding More</li> <li>- Taking away</li> <li>- Spatial Reasoning (2)</li> <li>- Compose and decompose</li> </ul> <p><b>Find My Pattern</b></p> <ul style="list-style-type: none"> <li>- Doubling</li> <li>- Sharing &amp; Grouping</li> <li>- Even &amp; Odd</li> <li>- Spatial reasoning (3)</li> <li>- Visualise and build</li> </ul> <p><b>On the Move</b></p> <ul style="list-style-type: none"> <li>- Deepening understanding</li> <li>- Patterns &amp; Relationships</li> <li>- Spatial Reasoning (4)</li> <li>- Mapping</li> </ul>

# Key Stage 1

Class 1   Year 1/2			
Term	Autumn	Spring	Summer
Core Learning - Y1	Number & Place Value (Within 10) Addition & Subtraction (Within 10) Shape	Place Value (Within 20) Addition & Subtraction (Within 20) Place Value (Within 50) Length & Height Mass & Volume	Multiplication & Division Fractions Position & Direction Place Value (Within 100) Money Time
Core Learning - Y2	Number & Place Value Addition & Subtraction Shape	Money Multiplication & Division Length & Height Mass, Capacity & Temperature	Statistics Fractions Position & Direction Time

# Lower Key Stage 2

Class 2   Year 3/4			
Term	Autumn	Spring	Summer
Core Learning - Y3	Number & Place Value Addition and Subtraction Multiplication and Division (1)	Multiplication and Division (2) Length and Perimeter Fractions Mass and Capacity	Fractions cont. Money Time Shape Statistics
Core Learning - Y4	Number & Place Value Addition and subtraction Multiplication and Division (1) Area	Multiplication and Division (2) Length and Perimeter Fractions Decimals	Decimals Money Time Shape Statistics Position and Directions

# Upper Key Stage 2

Class 3   Year 5/6			
Term	Autumn	Spring	Summer
Core Learning - Y5	Number & Place Value Addition & Subtraction Multiplication & Division (1) Fractions (1)	Multiplication & Division (2) Fractions (2) Decimals & Percentages Perimeter & Area Statistics	Shape Position & Direction Decimals Negative Numbers Converting Units Volume
Core Learning - Y6	Number & Place Value Four Operations Fractions (1) Fractions (2) Converting Units	Ratio Algebra Decimals Fractions, Decimals & Percentages Area, Perimeter & Volume Statistics	Shape Position & Direction  <b>Post SATs</b> - Themed projects, consolidation & Problem Solving

