



**(This policy cannot be seen in isolation but must be read in relation to the school's Curriculum policy, Assessment policy and Marking and Feedback policy.)**

|                                    |    |
|------------------------------------|----|
| How this policy was developed..... | 3  |
| Key roles in Mathematics.....      | 3  |
| Intent .....                       | 3  |
| Implementation .....               | 5  |
| Impact.....                        | 7  |
| Assessment.....                    | 8  |
| SMSC Development.....              | 9  |
| Equal Opportunities.....           | 10 |
| Inclusion.....                     | 10 |
| Parental Involvement.....          | 11 |

## How this policy was developed:

This policy was drawn together by the KS2 Mathematics Subject Leader supported by the KSI and EYFS Leaders. Staff and governors were consulted on the policy before it was adopted by the full governing body. The policy will be reviewed and put before governors at least every two years but more regularly where key changes are made.

## Key roles in Mathematics:

### **The Mathematics Subject Leader is responsible for:**

- ✓ this policy and its implementation including supporting staff in the delivery of Mathematics.
- ✓ ensuring that the governing body is kept up to date with any actions and initiatives that are relevant to the subject.
- ✓ writing the relevant part of the School Improvement Plan (SIP) and providing the headteacher and governing body with regular reviews of the SIP.
- ✓ identifying staff training needs and arranging or delivering CPD
- ✓ annual standardisation and moderation activities in school.

### **The Governing body are responsible for:**

- ✓ ensuring the effective delivery of the National Curriculum in Mathematics.
- ✓ identifying a link governor to liaise with the Mathematics Subject Leader and update the governing body with regular link governor reports annually.

## Intent:

At Castlecroft Primary School, we want to nurture a love and enjoyment of mathematics in all of our children so that they are keen to explore different concepts and so discover the wonder of mathematics and how it links to the world around them.

The intent of our Mathematics curriculum at Castlecroft Primary School is for pupils to develop into confident mathematicians. Our Mathematics curriculum is designed to equip our pupils with the mathematical knowledge and skills they need to become fluent and competent in the

basics of mathematics, developing their ability to calculate, reason and problem solve. Ultimately, we want all our pupils to develop a deep conceptual understanding of mathematical concepts.

Mathematics is important: it is integral to all aspects of life and we view mathematics as a creative and highly interconnected subject essential to science, technology and engineering and necessary for most forms of employment. With this in mind, we endeavour to ensure that children develop a positive and enthusiastic attitude towards Mathematics that will stay with them. We also believe that Mathematics teaches our children resilience.

We encourage all our children to reach their full potential and be aspirational. Through an exciting and challenging, carefully sequenced Mathematics curriculum, our pupils will:

- ✓ foster a positive attitude to Mathematics through practical activity, exploration and discussion.
- ✓ have the ability to recall age-appropriate facts rapidly and accurately.
- ✓ develop the ability to think clearly and logically, with confidence, flexibility and independence of thought.
- ✓ develop a deeper understanding of mathematics through a process of enquiry and investigation.
- ✓ develop an understanding of numbers and the number system and the connectivity of patterns and relationships within mathematics.
- ✓ develop the ability to apply knowledge, skills and recalled facts to a range of Mathematical problems and situations.
- ✓ become aware of the uses of mathematics in the wider world.
- ✓ develop the ability to use correct vocabulary as a means of articulating their reasoning and Mathematical thinking.
- ✓ develop the appropriate attitude and motivation to work both alone and cooperatively to solve mathematical problems.
- ✓ develop personal qualities such as perseverance, independent thinking, cooperation and self-confidence
- ✓ develop a practical understanding of how information can be gathered and presented.
- ✓ explore features of shape and space, and develop a variety of measuring skills which they are able to use confidently and accurately in a range of contexts.

The table below outlines the topics that are taught at each stage across the year beginning with EYFS.

| Year Group       | Autumn Term 1  | Autumn Term 2   | Spring Term 1  | Spring Term 2   | Summer Term 1   | Summer Term 2  |
|------------------|--|---|--|---|---|--|
| <b>Nursery</b>   | Counting (also within daily routines)<br><br>One to One correspondence<br><br>Numbers up to 5                                    | Size and Capacity<br><br>Number Songs   | Numicon – recognising Numicon up to 5<br><br>Comparing two quantities  | 2D Shapes<br><br>Daily Routines<br><br>Language related to time   | Recognising numerals up to 5<br><br>To notice patterns in the environment   | Positional Language<br><br>Comparing weight, length, height and distance.  |
| <b>Reception</b> | Counting to 10.<br><br>Sorting<br><br>1:1 Correspondence<br><br>Recognising numbers to 5.<br><br>Subitise to 5.<br><br>Patterns. | Counting to 10 & beyond.<br><br>Ordering numbers to 5.<br><br>Number bonds to 5 (part whole)<br><br>Describing Shapes.<br><br>Capacity. | One more/less to 10.<br><br>Adding to 10.<br><br>Subtraction within 10.<br><br>Recording numbers to 10.<br><br>Subitise to 10. | Number bonds to 10 (part whole)<br><br>Odd & even numbers.<br><br>Patterns<br><br>Time (yesterday, today, tomorrow) | Counting in 2's, 5's, & 10's.<br><br>Number bonds to 10.<br><br>Subitising.<br><br>Doubling, Halving, Sharing.<br><br>Positional language | Counting to 20 & beyond.<br><br>Counting<br><br>Time (o'clock)<br><br>Solve problems – weight, height, length, distance. |
| <b>Year 1</b>    | Place Value (within 10)<br><br>Addition & Subtraction (within 10)  | Addition & Subtraction (within 10) continued<br><br>Shape   | Place Value (within 20)<br><br>Addition & Subtraction (within 20)  | Place Value (within 50)<br><br>Length & Height<br><br>Mass & Volume   | Multiplication & Division<br><br>Fractions<br><br>Position & Direction  | Place Value (within 100)<br><br>Money<br><br>Time  |
| <b>Year 2</b>    | Place Value<br><br>Addition & Subtraction  | Addition & Subtraction (continued)  | Money<br><br>Multiplication & Division   | Length & Height   | Fractions<br><br>Time   | Statistics<br><br>Position & Direction   |

|               |  |   |   |   |  |   |
|---------------|--|---|---|---|--|---|
|               |  | Shape   |   | Mass,<br>Capacity &<br>Temperature  |  |   |
| <b>Year 3</b> | Place Value<br><br>Addition &<br>Subtraction                                 | Multiplication<br>& Division A                            | Multiplication<br>& Division B<br><br>Length &<br>Perimeter | Fractions A<br><br>Mass &<br>Capacity   | Fractions B<br><br>Money<br><br>Time                 | Shape<br><br>Statistics   |
| <b>Year 4</b> | Place Value<br><br>Addition &<br>Subtraction                                 | Area<br><br>Multiplication<br>& Division A                | Multiplication<br>& Division B<br><br>Length &<br>Perimeter | Fractions<br><br>Decimals A   | Decimals B<br><br>Money<br><br>Time                  | Shape<br><br>Statistics<br><br>Position &<br>Direction          |
| <b>Year 5</b> | Place Value<br><br>Addition &<br>Subtraction                                 | Multiplication<br>& Division A<br><br>Fractions A         | Multiplication<br>& Division B<br><br>Fractions B           | Decimals &<br>Percentages<br><br>Perimeter &<br>Area<br><br>Statistics                          | Shape<br><br>Position &<br>Direction<br><br>Decimals | Negative<br>Numbers<br><br>Converting<br>Units<br><br>Volume    |
| <b>Year 6</b> | Place Value<br><br>Addition,<br>Subtraction,<br>Multiplication &<br>Division | Fractions A<br><br>Fractions B<br><br>Converting<br>Units | Ratio<br><br>Algebra<br><br>Decimals                        | Fractions,<br>Decimals &<br>Percentages<br><br>Area,<br>Perimeter &<br>Volume<br><br>Statistics | Shape<br><br>Position &<br>Direction                 | Consolidation<br><br>Themed<br>Projects &<br>Problem<br>Solving |

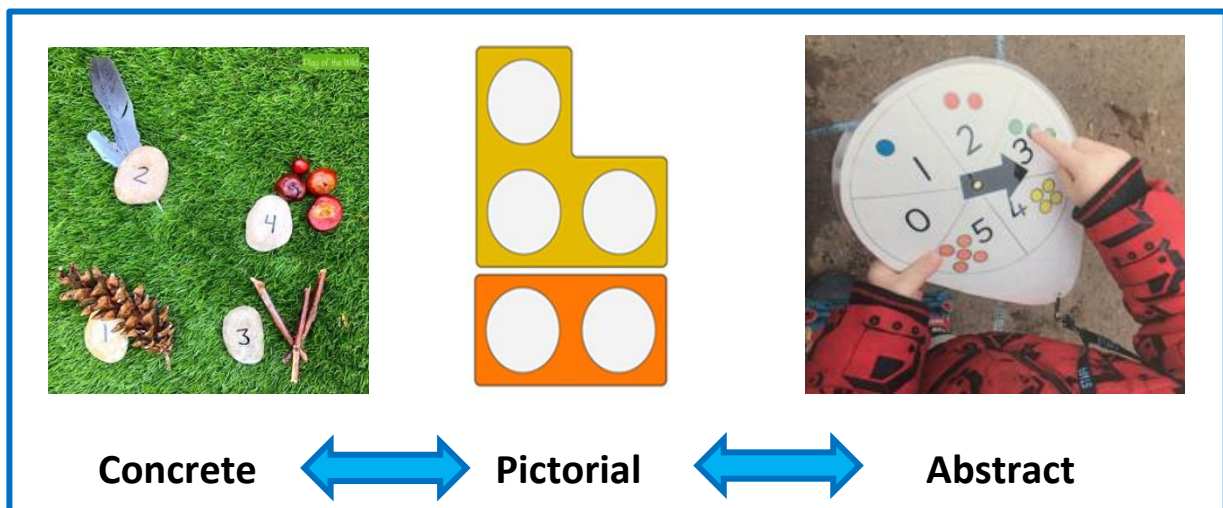
- **Please refer to the knowledge and skills progression map from EYFS to Year 6 which sets out the specific mathematical knowledge and skills that pupils will gain at each stage.**

## Implementation:

### EYFS Mathematics

At Castlecroft, we believe that having a solid foundation in number is crucial to helping children develop and excel mathematically. Therefore, within Early Years, we encourage our children to use number not only when taking part in adult led activities but also through stories, number rhymes, imaginative play, games and practical work. We ensure children are given as many opportunities as possible to engage in child initiated play which allows them to build and apply their understanding of number and number patterns.

In addition to this, we provide a language rich environment filled with a range of resources which allow our children to develop their reasoning skills. They are encouraged to spot shapes within the environment, look for patterns and talk about what they notice. We want our children to become keen problem solvers and show curiosity about the world around them through positive interactions. It is essential that children are confident and enthusiastic when developing a love for Mathematics, in order for them to express their ideas and learn. Our Early Years approach within Mathematics is to question sensitively, model effectively and scaffold children in order to develop and build on their skills. Supported by the Numicon programme, children use concrete resources to secure the concepts of subitising and conservation of number. The pupils' understanding is extended through relating the 'concrete' stage to the 'pictorial' stage. Through using images and visual representations, pupils develop a deep understanding of number. Pupils then connect this to numerals in the abstract stage.



## KS1 and KS2 Mathematics

At Castlecroft Primary School we follow the White Rose Maths Scheme of Learning as the basis of our Mathematics teaching. Each topic is broken down into a coherent sequence of smaller steps that pupil's need to achieve in order to develop a deep understanding of the concept.

The image below shows an example of how the following end of year National Curriculum objectives for Year 2 linked to number and place value in Autumn Block 1 are broken down into a coherent sequence of 17 smaller steps:

- count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward
- recognise the place value of each digit in a two-digit number (10s, 1s)
- 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

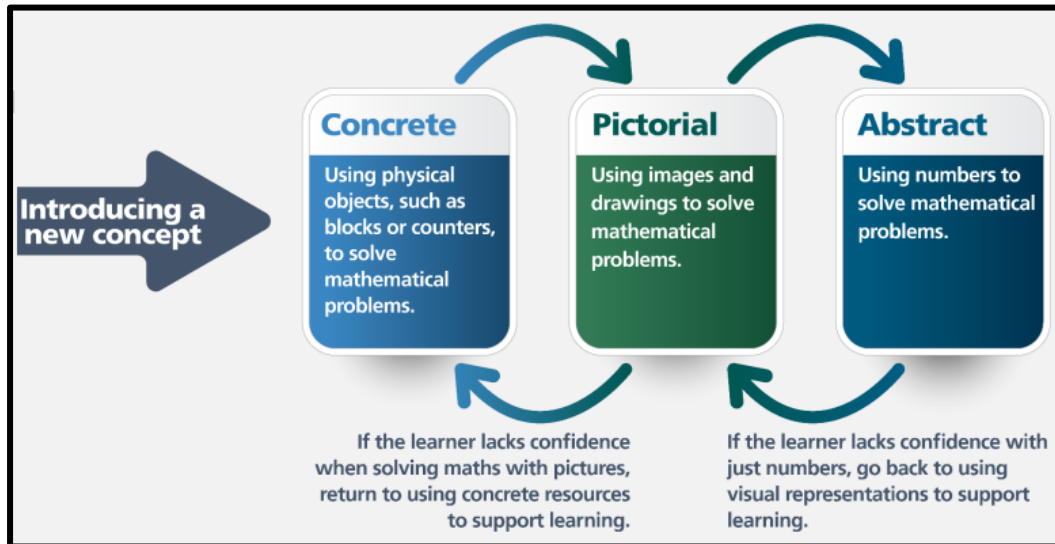
### Overview

### Small Steps

|   |   |
|---|---|
| Counting forwards and backwards within 20                             | R |
| Tens and ones within 20   | R |
| Counting forwards and backwards within 50                             | R |
| Tens and ones within 50   | R |
| Compare numbers within 50   | R |
| Count objects to 100 and read and write numbers in numerals and words |   |
| Represent numbers to 100  |   |
| Tens and ones with a part-whole model                                 |   |
| Tens and ones using addition  |   |
| Use a place value chart   |   |
| Compare objects   |   |
| Compare numbers   |   |
| Order objects and numbers   |   |
| Count in 2s   | R |
| Count in 5s   | R |
| Count in 10s  | R |
| Count in 3s   |   |



A central feature to teaching mathematics in KS1 and KS2 is the CPA approach (Concrete, Pictorial, Abstract). The image below from the NASEN Teacher Handbook (Page 59) illustrates our approach to teaching new mathematical concepts.



Teachers encourage all our learners to go through the process as outlined in the image above in order to help them make connections and deepen their mathematical understanding. Concrete resources are a useful scaffold to help children see the underlying structure of the mathematics. However, our aim is to avoid children becoming over-reliant on the manipulative. Teachers achieve this by decreasing the proportion of concrete representations and increasing the proportion of abstract representations as the learning sequence progresses. Learners with SEND may require the support of concrete resources for a slightly longer period but are scaffolded to develop independence in engaging with the mathematics without the resource.

Each new 'block' of work begins with an 'Assess and Review' lesson of previous learning to enable teachers to amend planning and groupings to meet the needs of their children. Groupings are therefore flexible and determined by these assessments. Children are grouped in three differentiated levels:

**'Silver'** is for those children requiring extra support in that particular block of work.

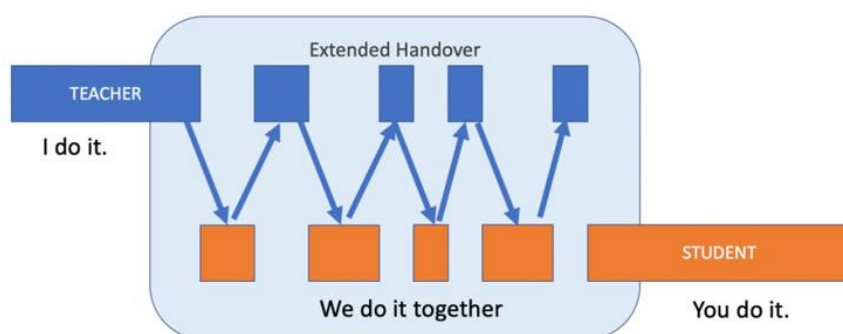
**'Green'** is for children expected to meet their Age Related Expectations (ARE) in that block.

**‘Purple’** is for children expected to exceed their Age Related Expectations (ARE) in that block.

To ensure consistency of approach, we have developed a lesson structure that all teachers follow. The lesson structure is broken into the following stages:

- 1) Flashback 4
- 2) Arithmetic
- 3) Recap
- 4) Teach
- 5) Application (Fluency, reasoning and problem solving)
- 6) Plenary

Each lesson begins with the ‘White Rose Flashback 4’ questions which focus on previous learning (prior day, last week, last term, last year). This ensures that our pupil’s retain key learning over time. During the ‘Teach Stage’ of the lesson, the teacher models/explains the new concept/skill using a worked example (I do). Pupils then engage in guided practice using varied examples (We do). The purpose of the ‘We do’ is for our pupils to practise in pairs/independently under the direction of the teacher before they attempt independent work. This is to reduce the amount of errors they make during independent work. Pupils work on mini whiteboards to demonstrate their understanding/proficiency of a skill. Teachers systematically check for understanding, for example using ‘Show me’ to identify errors or misconceptions and to make a teaching point if needed. The image below illustrates this stage of the lesson.



During the application stage, most children work on the same tasks. The tasks are designed to develop pupil’s fluency as well as provide opportunities for them to reason and problem solve. Differentiation is achieved through the use of adult support and scaffolding, for example,

through the use of concrete resources. This will still apply to some pupils who are working significantly below age related expectations. However, these pupils could be working on tasks that are more appropriate for them based on their starting point.

- **Please refer to the lesson structure document which outlines each stage of the lesson in more detail.**

Across school, there is a daily opportunity to practise key skills, calculations and recall of number facts in a 'Morning Maths' session in addition to the daily Mathematics lesson. From Year 2, onwards children begin a developmental homework system to support them to learn their times tables. Our aim is that all children will be fluent in their times tables by Year 4. Children have a weekly test and when they have passed their times tables tests they are awarded a certificate in assembly. To support this aspect of homework school has invested in the TTRockstars, MyMaths and StudyLadder programmes.

## Impact:

As a result of our quality curriculum and good teaching:

(PUPIL VOICE):

- ✓ children are able to talk confidently about their Maths lessons using appropriate vocabulary. They are able to make links between different topics in Maths and enjoy being challenged appropriately.
- ✓ children develop a range of skills and strategies which enable them to tackle different calculations and problems in a variety of contexts. They are able to justify their thinking and reason about their answers.
- ✓ they are able to use the knowledge and skills they have acquired to solve problems and present findings in different lessons across the curriculum.

(ATTAINMENT):

- ✓ children achieve their age related expectations and where there are gaps in their knowledge they receive carefully planned support and intervention to accelerate their progress and narrow the gap. More able children, who are identified as having the potential to achieve Mastery level, are challenged with carefully differentiated work and supported where necessary to ensure that they too fully achieve.

(OUTCOMES):

- ✓ worktrawls evidence a broad and balanced curriculum and demonstrate children's acquisition of age-related knowledge and skills. Monitoring of teacher's planning and lesson observations will show that pupils are developing their confidence and understanding of mathematical concepts and are able to apply their learning in a variety of ways.
- ✓ children's work shows how our calculation policy supports the development of these important skills.

(CROSS CURRICULUM):

- ✓ children confidently apply the skills that they have developed in Maths to work in other subjects.
- ✓ children use appropriate subject related technical words in cross-curricular work.

## Assessment:

Assessment for learning is continuous throughout the planning, teaching and learning cycle. Assessment data is collected in the following ways:

### FORMATIVE:

- ✓ observing children at work individually, in pairs and in groups
- ✓ using a range of carefully planned, differentiated, open ended questions that require children to explain their understanding and using supplementary questions to deepen their thinking further
- ✓ self-assessment and peer marking encourages the children to understand where they have been successful and where they need further help
- ✓ marking: Teachers use a developmental feedback system to mark the children's work. The ABC system, as it is known in school, ensures that children quickly know whether they need additional support (A), have achieved all of the LO and success criteria, (B) or whether they have corrections to do (C) Where children receive an A, teachers plan targeted intervention and re-teach activities to address the pupils' misconceptions in a smaller group. Marking comments are used to encourage children to correct their own work.

### SUMMATIVE:

- ✓ weekly times tables tests are carried out across Key Stage 2. Year 2 children begin these tests during the Spring term.

- ✓ authority annual baseline and endline tests identify school areas for development and benchmark us against other schools
- ✓ teachers make summative end of term 'age related' judgements based on their formative data. These are recorded on the data trackers. To assist teachers in making these data judgements, Gathering Records are completed against the objectives for each child in Mathematics.
- ✓ summative assessment judgements are monitored and books are scrutinised in worktrawls regularly.
- ✓ Mathematics moderation exercises are carried out in school and with our network of schools annually. End of key stage moderation training is attended by Yr2 and 6 teachers.
- ✓ SMT hold data meetings with teachers to analyse the data, look for barriers to learning and identify children requiring intervention.
- ✓ pupils participate in all national tests:
  - Year 6 pupils undertake SATs in May.
  - Year 2 pupils undertake SATs assessment tasks in May.
  - Year 4 pupils will undertake the National Multiplication Tables Check.

Children's attainment in Mathematics is reported to parents in termly parents' evenings and in the end of year report which also includes end of Key stage results.

## SMSC Development:

At Castlecroft, we recognise that spiritual, moral, social and cultural education is central to the education of all pupils and permeates the whole curriculum and ethos of the school. It is reflected in the behaviours of individuals and in their interactions and also in the provision of teaching resources and learning environments.

**SMSC** is taught through and reflected in our Mathematics curriculum in many ways.

**Spiritual:** The study of Mathematics enables children to make sense of the world around them and we strive to enable pupils to explore the connections between their numeracy skills and every-day life. Developing deep thinking and an ability to question the way in which the world works promotes the spiritual growth of pupils. Children are encouraged to see the sequences, patterns, symmetry and scale both in the man-made and the

natural world and to use Mathematics as a tool to explore it more fully.

**Moral:** The moral development of children is an important thread running through the Mathematics curriculum. Pupils are provided with opportunities to use their Mathematics skills in real life contexts, applying and exploring the skills required in solving various problems. All children take part in an annual 'Maths Enterprise' project where they plan, produce and sell a 'product' to create a profit for their class. Each class then decides how best to spend the money raised to improve their class. (This project also links to children's social development.) Mathematics also supports pupils' moral development through discussion about mathematical understanding and challenging assumptions, supporting children to question information and data that they are presented with. Mathematics helps children to understand and use rigorous and logical argument and discourages jumping to conclusions when trying to determine the truth.

**Social:** Mathematics encourages collaborative learning in the classroom in the form of listening and learning from each other and paired discussion and working with partners. Problem solving skills and teamwork are fundamental to Mathematics through creative thinking, discussion, explaining and presenting ideas. As children become increasingly confident at explaining, reasoning and justifying their answers, they realise their own strengths and feel a sense of achievement and raised self-esteem. Over time they become more independent and resilient learners.

**Cultural:** Mathematics is a universal language with a broad range of cultural inputs throughout the ages. Mathematics supports children's cultural development by developing an appreciation that Mathematics, its language and symbols have developed from many different cultures around the world over a long period of time. Various approaches to Mathematics from around the world are used and this provides an opportunity to discuss their origins. We try to develop an awareness of both the history of Mathematics alongside the realisation that many topics we still learn today have travelled across the world and are used internationally.

## Equal opportunities:

At Castlecroft Primary School we are committed to providing a teaching and learning environment which ensures equal access to our Mathematics curriculum regardless of social class, gender, ethnicity, culture, home background, special need or disability. We are committed to enabling all pupils to reach their full potential.

In the realm of mathematics, the representation of race and disability through images of characters plays a crucial role in fostering inclusivity and breaking down stereotypes. All maths materials feature diverse characters from various racial backgrounds, ensuring that students can identify with and see themselves in the mathematical context. Moreover, these materials depict characters with disabilities engaging in mathematical activities, challenging preconceptions and reinforcing the idea that mathematical prowess is not limited by physical ability. By portraying a rich tapestry of individuals in mathematical scenarios, we aim to create an environment where every student feels seen, valued, and capable, irrespective of their racial or physical characteristics.

## Inclusion:

All pupils are entitled to access the Mathematics curriculum at a level appropriate to their needs and abilities. Teachers plan carefully and use a range of strategies to ensure full accessibility and sufficient challenge for all. The school makes efficient use of additional adults, deployed effectively to ensure that our curriculum is accessible for all.

To ensure inclusion:

- ✓ as a school with a VI base we are committed to ensure full inclusion for our VI pupils who are taught in class alongside their peers. These pupils are only withdrawn for specific needs such as mobility lessons. One to one support in lessons as appropriate, alongside quality modified resources ensures that these pupils make good progress and attain well.

- ✓ pupils or groups of pupils with additional needs or those who are under-achieving are identified through our assessment system and appropriate intervention carefully planned and monitored for impact.
- ✓ data is analysed and action taken to ensure that any gaps between the performance of girls and boys is narrowed.
- ✓ data is analysed and action taken to ensure that ethnicity does not affect attainment.
- ✓ teachers and teaching assistants are all aware of disadvantaged pupils ensuring that they are targeted for support in lessons ensuring that they perform in line with non-disadvantaged pupils in the same ability band.
- ✓ more able pupils are identified early to ensure that sufficient learning challenge is provided. Where pupils are not achieving to their full potential then careful intervention accelerates their progress.
- ✓ children with identified SEND (including pupils with an EHCP) who have Mathematical targets receive support and intervention as appropriate to their needs.
- ✓ our number of EAL children is significantly below the national average however advice is sought and support and intervention used where necessary to ensure good progress and attainment for these pupils.
- ✓ As with all other Curriculum areas, we seek to ensure equality of access for our children with special needs, to the same educational opportunities as those available to the rest of the population. SEND children have an entitlement to a broad, balanced curriculum, which is relevant to their needs, and which is delivered using reasonable adjustments where appropriate to help them access quality teaching and learning. Our SEND children-including our visually impaired (VI) children-will have activities and resources adapted by SEND support staff, VI support staff and teachers. In order to provide quality first teaching, it may be necessary to enhance the curriculum and resources available to pupils with special educational needs. Where necessary, Outreach and the Nurse team (or the Wolverhampton SEND Nurse) will be contacted for specialist advice and support with adapting teaching (especially for pupils on an EHCP plan, or with Complex SEND).
- ✓ Some children in school are unable to access a subject specific curriculum and in this case their learning is guided, and progress tracked, by the engagement model in line with government guidelines. Children within this group who have a diagnosis of ASD will have their small steps of progress tracked using SCERTS.



## Parental Involvement:

Parents play a vital role in the development of Mathematics skills. We aim to foster a strong home-school partnership and offer support for parents. At key points in their children's development, meetings are offered to support parents in helping their child's Mathematical development at home - for example in Yr.2 and Yr.6 to help parents to understand how best to support their children with SATs. Parents support the school homework system. Our school calculation policy is shared with parents so that they can support their children when completing homework using the methods taught in different year groups.