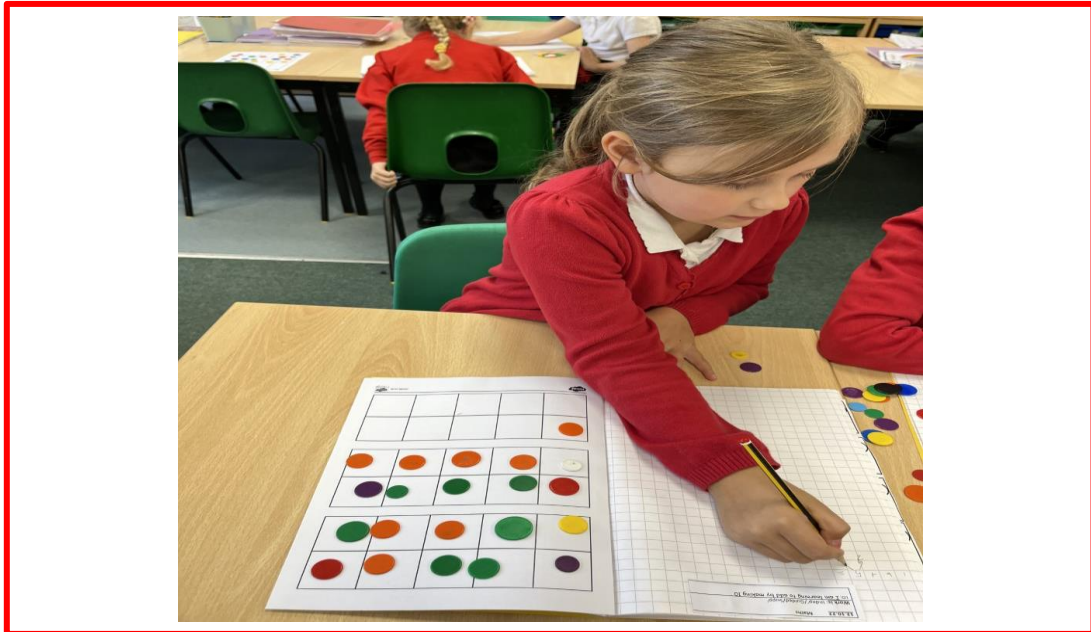


Maths



Curriculum Booklet

Maths Intent

Why do we teach this? Why do we teach it in the way we do?

The intent of Tanners Brook Primary School's Maths curriculum is to ensure that all children are confident and competent in their mathematical knowledge so that they are able to **make sense of the world** around them and recognise that maths is essential to **everyday life**.

We want all our pupils to experience the power and enjoyment of being **mathematicians** and develop a sense of curiosity about this subject with a clear understanding. This will raise the profile of maths and consequently the aspirations of all our children.

It is our belief that children should view maths as an interconnected subject so that they are able to use and apply their existing knowledge to new situations, moving confidently and fluently between different representations of mathematical ideas as excited mathematicians. We use **mistakes** and misconceptions as an essential part of the **learning journey** and provide **rich and challenging problems**.

Throughout the year, maths events will be organised to promote mathematics to improve the engagement of parents and our community. We aspire for both children and adults to enjoy maths and recognise that everyone can succeed in this subject.

In line with the National Curriculum, we aim for all pupils to:

- become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- be able to solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to real-life scenarios
- **reason mathematically** by following a line of enquiry and develop and present their ideas using **mathematical language**.
- Additionally, we want our children to have an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, **fluently**, and accurately to be successful mathematicians.

Our curriculum is frequently reviewed to ensure that it is current and effective and teachers are supported and aided in their teaching of mathematics through appropriate high-quality continuing professional development through external and internal training, online training, monitoring, coaching and support from Solent Maths Hub. This will ensure confidence in the skills and knowledge that they are required to teach.

Maths Implementation

What do we teach? What does this look like?

Our whole curriculum is shaped by our school vision which aims to enable all children, regardless of background, ability and additional needs, to strive to achieve their personal best and make our community proud.

We teach a broad and balanced mathematical curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. We focus not only on the mathematical methods but also on mathematical vocabulary to broaden and deepen mathematical understanding.

Children are taught mathematics for approximately 1 hour daily with additional lessons for Maths Skills, including Number Sense Maths. Support is determined during each lesson to ensure secure understanding based on the needs of the child. A mix of adult led and child led activities are put together for children in EYFS.

Teaching is whole-classed based, supported by appropriate differentiation, for Year 1 to Year 4. Due to the differing needs of pupils in UKS2, pupils are taught in focus groups. In EY, mathematics is part of the daily learning tasks and is taught through Discovery Time or outdoor learning.

We are committed to ensuring that pupils secure their knowledge of Times Tables and Related Divisional Facts by the end of Year 4. Our pupils engage in regular low stakes testing through Times Tables Rock Stars to practice fluent recall.

At Tanners Brook Primary School, we follow the National Curriculum and use White Rose Schemes of Work and the Overview Small Steps as a guide to support teachers with their planning and assessment. These have been adapted to meet the needs of our children. This ensures coverage and that the children are given all the stages required to move forwards with this learning.

Structure of our lessons:

Warm-up: The purpose of these is to start children 'thinking mathematically' and to establish a mathematical mindset. This will involve counting (KS1) and will also be comprised of a recap through the use of games, loop activities, short open-ended problems (for which solutions can be shared or discussed). In UKS2, these may cover a variety of skills and areas of the curriculum and often have an arithmetic focus. Our warm-ups don't necessarily need to be directly related to that lesson's content – although they may 'bridge' into our explicit teaching session.

Explicit Teaching: This is the teacher introducing new concepts or revising existing concepts through the use of explanation and modelling.

Practice: It is important that our children consolidate and reinforce their understanding of mathematical concepts with practice on set exercises based on the explicit teaching. Sound practice or development of fluency in mathematics will ensure that student exercises are scaffolded appropriately (e.g. similar examples; prompts; one-to-one or small group coaching where available; provision of tactile and/or visual learning resources such as blocks, diagrams, counters...) to make exercises accessible for students still not confident with concepts. Students work either individually or together on a problem (related to the focus for the lesson).

Targeted Challenge: Once a level of mathematical fluency has been established (ie, they've successfully completed some practice questions), children need to move on to a challenge question to develop higher order thinking skills. This will involve problem solving and reasoning and the opportunity to apply the new concept from the explicit teaching. This will further and deepen the children's understanding. Often, this question will involve previously taught concepts.

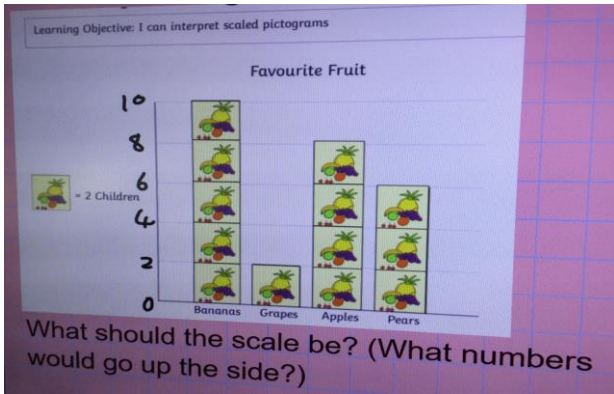
In you were to walk into Maths lesson at TBPS you will see:

- Small steps between and within lessons
- Mini plenaries
- Scaffolds used to support children
- Precise and targeted questions that are carefully planned and used throughout to target children's fluency, reasoning skills and progress.
- Children given opportunities and encouraged to identify and recognise patterns and rules, rather than just show how to find the answer.
- Concrete, pictorial and abstract representations used fluidly to allow deep, sustainable learning for all
- Children understanding and using the correct, precise mathematical vocabulary when explaining their maths.
- Opportunities to practise and use number skills and apply them in different contexts.
- Maths displays that are interactive and relevant to the learning happening the lessons. These 'working walls' may provide key information and vocabulary with modelled examples to support learning as well as showcasing children's work to give a sense of pride.

- Adults moving between tables to support and question children to deepen their understanding.
- Calculation practice is provided regularly through basic skills starter activities to ensure children's fluency in calculation methods is embedded.
- Learning is differentiated to meet the needs of the children within the class whilst still providing each child with the opportunity to achieve the learning intentions to meet the expectations of their year group.
- A love of maths being encouraged throughout the school via links with other subjects, applying an ever-growing range of skills with growing independence.
- Children with additional needs are included in whole class lessons and teachers provide scaffolding and relevant support as necessary. For those children who are working outside of the year group curriculum, individual learning activities are provided to ensure their progress.
- That we encourage resilience and acceptance that struggle is often a necessary step in learning.
- Practice and consolidation playing a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.
- Children marking their learning as they go when and where appropriate.
- Links with learning in NSM and times tables etc.
- Our Calculation Strategy Policy being used within school to ensure a consistent approach to teaching the four operations over time.

4-Part Lesson

Warm-ups



Menu
Week 2 Day 3

Fluency
Complete these questions.

- $384 + 245 =$ Reveal answer
- $\square = 156 \div 6$ Reveal answer
- $15\% \text{ of } 340 =$ Reveal answer
- $100 \times 634 =$ Reveal answer
- $38\,332 - 9375 =$ Reveal answer
- $4 \times 10 \times 8 =$ Reveal answer

Problem Solving
Write the three missing digits to make this subtraction correct.

$$\begin{array}{r} \square \ 1 \ \square \\ - 4 \ \square \ 4 \\ \hline 2 \ 4 \ 4 \end{array}$$

Reveal answer

Reasoning
George has to explain how to round 4.95 to the nearest tenth. Use the blank number line to help George.

Starter 23.03.22

▶ 0:00:00

1) $5 \times 2 = 10$ 2) $3 \times 4 = 12$

3) $4 \times 5 = 20$ 4) $6 \times 3 = 18$ **Challenge!**

5) $7 \times 7 = 49$ 6) $8 \times 8 = 64$ $6^2 + 3^2$

(Think Brucie!)

Yesterday

$22 - 10 =$

$43 - 10 =$

$65 - 10 =$

$76 - 10 =$

Last term

$78 \times 3 =$

Last week

How many tenths?

Fraction and decimal.

Last year

Explain the mistake in this calculation.

$\frac{2}{3} + \frac{1}{3} = \frac{3}{6}$

warm up

Maths Revision Morning Starters Week 6 Task 1

▶ 0:00:00

- $1.09 \times 10 = 10.9$
- $56 \times 12 = 672$
- $972 \div 9 = 108$
- James has 6 apples. He cuts each apple into quarters. How many pieces of apple does James have? *24 pieces*

LO: I am learning to solve problems

1 A shape is made up of four rectangles. The area of each rectangle is shown.

10 cm ²	45 cm ²
16 cm ²	72 cm ²

What is the perimeter of the shape?

2 Sam and Zach each have some money.

Sam spends $\frac{1}{4}$ of her money.

Zach spends 90% of his money.

They each have £60 left.

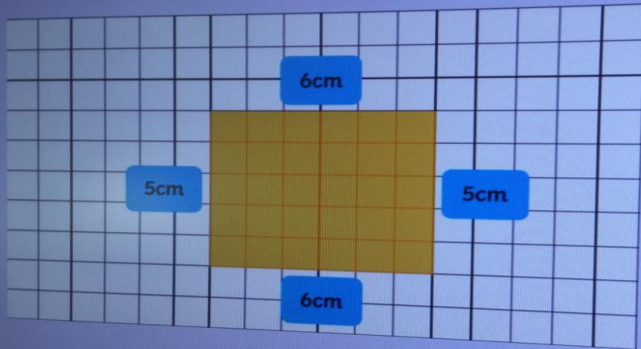
How much more money did Zach have at the start than Sam?

Learn Its



Explicit Teaching

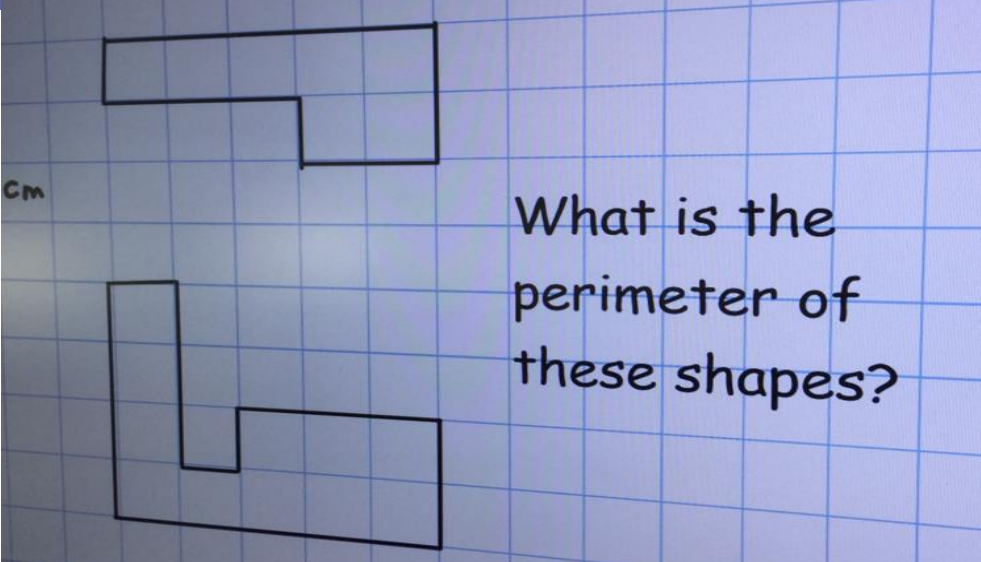
Teach.
Perimeter is the distance around the edge of a shape.



What measurements are we going to need?

What numbers are we adding together?

___ + ___ + ___ + ___ = ___ cm




What is the perimeter of these shapes?

Bus Timetable				
Twinkl Station	06:37	09:20	12:00	18:45
Twinkl Airport	06:57	09:40	12:20	19:05
Twinkl City Centre	07:15	09:58	12:38	19:33
Twinkl Hotel	07:43	10:26	13:06	19:51

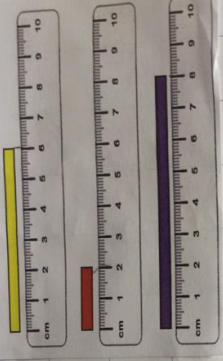
Which bus should I catch from Twinkl Station to arrive at the Twinkl Hotel by 8 p.m.?

If I catch the 9:40 bus from Twinkl Airport, what time will I arrive at the Twinkl Hotel?

How long will my journey take to the Twinkl City Centre if I catch the 06:37 bus from Twinkl Station?



Practice



The yellow strip is 6 cm ✓
 The red strip is 1 cm ✓
 The purple strip is 8 cm ✓
 The purple strip is the tallest ✓
 The red strip is the shortest ✓
 The yellow strip is 6 cm.

I can find fractions of amounts

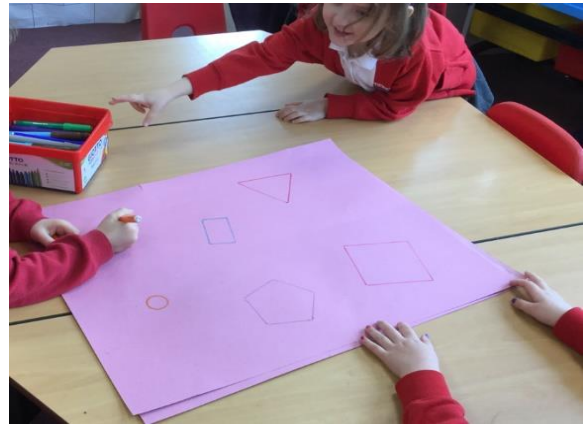
1. Kamila made a chocolate cake. She cut the cake into 20 slices. Selyna ate $\frac{2}{5}$ of the cake. How many slices did she eat?

$\frac{2}{5}$ of 20 = 8
 $4 \times 2 = 8$
 she eat 8 slices.

2. Rivea collected 24 stickers and gave $\frac{2}{6}$ to Katie. How many stickers did Katie receive?

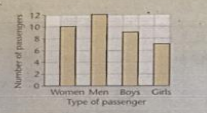
$\frac{2}{6}$ of 24 = 8
 $4 \times 2 = 8$
 Katie receives 8 stickers.

3. Luke cleaned 25 cars in one day. He cleaned $\frac{3}{5}$ of them before lunch. How many did he clean after lunch?



Date: 15/09/22 Learning Objective: I am learning to use bar graphs. G/Y

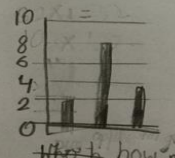
This graph shows the passengers on a bus.



What numbers are not on the scale (y-axis)?
 odd number

- How many women were on the bus? 10 ✓
- How many boys were on the bus? 22 ✓
- How many adults were passengers? 19 ✓
- How many more women than girls were passengers? 2 ✓
- How many fewer boys than men were passengers? 13 ✓
- How many passengers were there altogether? 51 ✓

Write your own questions for a friend.



How many



The abacus is heavier than the worm.

Challenge

Challenge

Problem solving

Name three items that are lighter than a football.

Name three items that are heavier than a book.

How do you know?

Challenge

Draw lines with a ruler to show the following measurements.
4 cm, 7 cm, 13 cm, 10 cm and 9 cm.

4 cm ✓
7 cm ✓
13 cm ✓

Q1. William wants to travel to Paris by train. He needs to arrive in Paris by 8:30 pm. Circle the latest time that William can leave London.

Leaves London	Arrives Paris
12:01	18:22
12:25	18:58
12:31	18:53
14:01	17:26
14:31	17:53
15:31	18:53
18:01	19:20

1 mark

Q2. Here is part of the morning bus timetable from Rowdale to Malt Haven.

Rowdale	10:02	10:12	10:31	10:48
Kingfisher	10:11	10:21	10:38	10:55
Fairburn	10:28	10:38	10:54	11:11
Eastwood	10:36	10:46	11:00	11:17
Malt Haven	10:53	11:01	11:17	11:34

How many minutes does it take the 10:31 bus from Rowdale to reach Malt Haven?

minutes

1 mark

Q3. Here is part of the morning bus timetable from Winton to Yanbury.

Winton	8:25	8:35	10:15	10:30
Higgin	8:40	10:00	10:25	10:40
Carton	10:01	10:21	10:41	11:01
Dobey	10:23	10:43	11:03	11:23
Yanbury	10:45	11:15	11:35	11:55

How many minutes does the bus take to get from Higgin to Dobey?

minutes

1 mark

Megan is in Carton. She wants to be in Yanbury before 11:30. What is the time of the latest bus she can take from Carton?

1 mark

One morning, the 10:35 bus from Winton gets to Carton 3 minutes early. What time does it get to Carton?

1 mark

Q4. Bill Evans is in Fairburn at 10:30. What is the earliest time he can reach Trenton on the bus?

Challenge

Here is a Rekenrek made from 100 beads.

If the Rekenrek represents one whole, what fractions have been made on the left and on the right?

Can you partition both of the fractions into tenths and hundredths?

Support:

Look at the counters in the picture. The 2 groups of counters must add up to 100. How many counters could there be in each group?

Challenge

The pencil is 5 cubes in length.

Is Kat correct? No, it is 6.

Challenge:

5cm

10cm

Not actual size

Show your method

cm

Robbie collected information about the colours of some bikes. Here are his results.

Colour	Number of bikes
green	4
red	7
blue	12
pink	3

This bar graph shows the information from the table. Fill in all the missing labels.

Number of bikes

12, 10, 8, 6, 4, 2, 0

blue, green, pink, red

15/3/22

Find the area of each colour in the rectangle.

8 cm

6 cm

Children say that they, 'like the challenges everyday in Maths lesson; we like trying to work them out.' 'I like putting my skills to the test. I can apply what I know to problems and the challenges that we have every day.' Children like Maths because 'all the problems are fun to do.'

Early Years

Our EYFS curriculum is in line with Early Years Foundation Stage Framework.

In Maths, you will see:

- Number fluency being continually developed.
- Children participating in short maths sessions daily and being given time to explore mathematical concepts, test ideas, develop their understanding and practise taught skills through play.
- Maths in all areas of our provision and is experienced in a purposeful and meaningful context within their play and daily routines.
- Children exploring number, shape, space and measures through mud kitchen, role play, sand and water play and classroom routines.
- The encouraged use of mathematical understanding and skills in solving real-life problems by staff who identify and extend opportunities to foster this.
- Daily counting
- Creative and engaging opportunities for children to ignite their curiosity and enthusiasm for the subject,
- Activities and experiences that are frequent and varied and allow the children to build on and apply understanding of numbers to 10.
- Children using concrete manipulatives as a key focus, as is the use of pictorial representations including Tens Frames and Part-Whole models.

- The actively encouraged use of mathematical terminology within their understanding.

Number Sense Maths (NSM)

Number Sense sessions are taught as either whole class (KS1 and LKS2) or as an intervention (UKS2). In KS1, these are taught daily as 15-minute number fact sessions.

In our NSM sessions you will see:

- A 3-part session: 1) Individual practice of previous learning; 2) Teaching and group discussion; 3) consolidation of that day's learning.
- The use of the NSM Number Facts Calculation Strategies
- Reference made to Maths lessons and linked classroom displays
- The use of animations to develop children's own mental images of number
- Small steps to improve children's ability to subitise and become fluent at calculations.
- Quick and pacey sessions
- 'Talk rich' sessions that help children to articulate and hone their own thoughts, reason and make connections
- Discussion and questions that draw attention to mathematical structure
- The trialling of the use of rekenreks in Year 2 to support and aid number fluency.

NRICH

Each year group uses an NRICH maths activity at least once every half term to help to embed the aims of the National Curriculum (number fluency, reasoning

and problem solving). These are mapped onto the Medium Term Plans for our new curriculum from September 2022.

In our NRICH lessons you will see:

- A 4-part lesson: 1) warm-up (this may be related to the main activity); 2) introduction of the task; 3) children working on the NRICH task supported by mini plenaries and pullbacks as necessary; 4) shared discussion of any outcomes and findings from the task.
- Reference made to Maths lessons and linked classroom displays
- ‘Talk rich’ sessions that help children to articulate and hone their own thoughts, reason and make connections
- Staff and children using mathematical language to explain ideas and thinking accurately.

Maths Impact

What will this look like? By the time children leave our school they will:

By the time children leave Tanners Brook Primary School in Year 6, we aim for them to be fluent in the fundamentals of mathematics with a conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They should have the skills to solve problems by applying their mathematics to a variety of situations with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios. Children will be able to reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language. Due to a consistent approach across the school, the children are confident to do this both verbally and in written work.

The quality and impact of our maths curriculum is measured across school through targeted learning walks, monitoring, pupil observations, discussions around work within school books ('book looks'), data analysis, conversations with parents and children and through pupil progress meetings.

Our curriculum is currently being reviewed and new LTP and MTP will be in place by September 2022; this will lead to outstanding progress over time across all key stages relative to each individual child's starting point. The impact of this new mathematics curriculum will be that children understand the relevance and importance of what they are learning in relation to real world concepts. Children will know that maths is a vital life skill that they will rely on in many areas of their daily life. Children have a positive view of maths due to learning in an environment where maths is promoted as being an exciting and enjoyable subject in which they can investigate and ask questions; they know that it is okay to be 'wrong' and that this can strengthen their

learning because the journey as mathematicians to finding an answer is most important.

Monitoring of the introduction of the 4-part lesson structure through learning walks shows that we now have more consistent teaching practices that are well-known to be more effective for pupil progress long term, evident across school.

Through monitoring, it is evident that our children are confident to 'have a go' and choose the equipment they need to help them to learn along with the strategies they think are best suited to each problem. Our children have a good understanding of their strengths and targets for development in maths and what they need to do to improve. Our maths books evidence work of a high standard of which children clearly take pride; the range of activities demonstrate good coverage of fluency, reasoning and problem solving. Our feedback and interventions support children to strive to be the best mathematicians they can be. Our school standards are high. We moderate our books and children are achieving well and most are on track or above.

Regular assessment opportunities using a variety of summative and formative assessment tools (including NFER, times tables checks, AFL, past SATs papers) ensures that learning is tracked and monitored to ensure all children make good progress. This allows teachers to plan accordingly to meet the needs of all pupils and, where necessary, plan for early support and intervention.

The introduction of Number Sense Maths has led to an increased focus on fluency throughout our school. Children are beginning to demonstrate quick recall of facts and procedures (including the recollection of the times tables); the flexibility and fluidity to move between different contexts and representations of mathematics; and the ability to recognise relationships and

make connections in mathematics. Children say that ‘it’s making my Maths better.’ They enjoy the lessons and ‘it has helped me answer more questions in my head. The videos really help this.’ They find that working with ‘smaller numbers first helps them with larger numbers.’ They like that as a result of the Number Sense Maths ‘we don’t need to use our fingers.’ Children’s fluency in number is evident in our proven track record of good success in arithmetic in the KS2 SATs.

The emphasis on accurate and consistent use of mathematical language is becoming more evident during whole class and pupil discussions and is supported by the whole school use of the Calculation Strategy Policy.

End of Key Stage statutory assessments are an indicator of how well we as a school ensure that Maths is a priority for our children.

2022	EXS+	GDS
Year 2	70%	9%
Year 6 (national)	73% (71%)	17%