

Maths at Shire Oak

Intent

Our intent at Shire Oak is:

- To create a learning environment that promotes mathematical thinking, where children have a positive attitude towards maths and enjoy maths lessons.
- To create a learning environment where children feel engaged in their learning and are comfortable to share responses including to make mistakes and have a growth mindset.
- To teach maths lessons that follow a carefully sequenced progression of skills building on previous knowledge within and across year groups starting from Reception.
- To closely monitor children's progress throughout the teaching sequence so that children who may need additional input can be identified and supported.
- To ensure that children have fluent recall of key maths facts and calculation methods and are quickly able to identify the maths needed.
- To ensure that children are able to make connections with maths in order to apply their learning into problem solving in a variety of contexts.
- To give children the language and confidence to be able to explain their mathematical reasoning.
- That children become confident mathematicians and leave school at the end of Year 6 with a good foundation of skills and a positive attitude towards maths which they can build on to be successful mathematicians at high school and into adult life.

These intentions are supported by the Early Years framework and the national curriculum for mathematics.

The Early Years framework states:

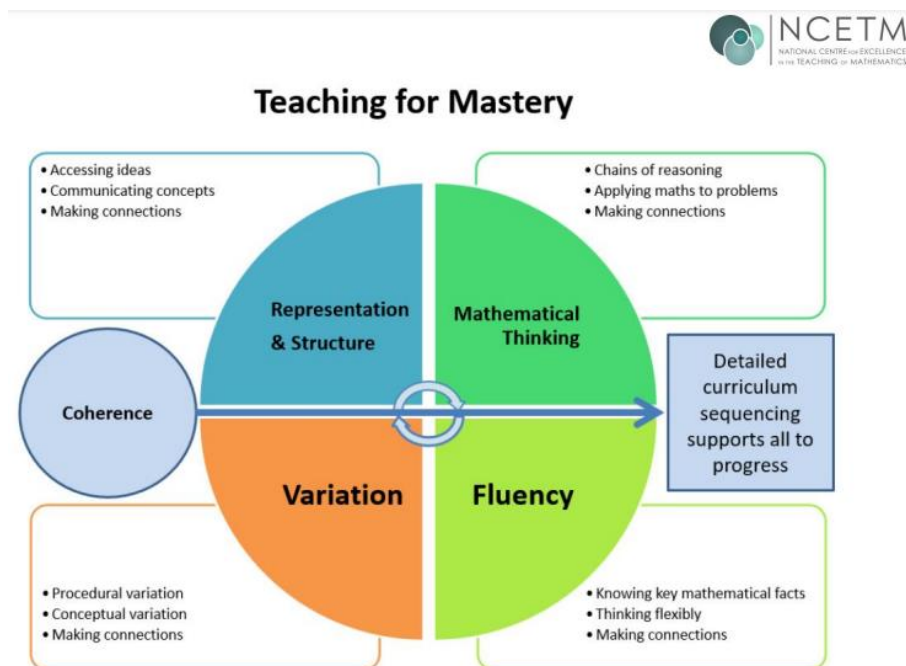
- *Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically.*
- *Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers.*
- *By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built.*
- *In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.*
- *It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.*

The national curriculum for mathematics aims to ensure that all pupils:

- *become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.*
- *reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.*
- *can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.*

Implementation

At Shire Oak we follow a mastery approach to the teaching of mathematics following the approaches set out by the NCETM and Maths Hubs. This includes the Five Big Ideas in Teaching for Mastery.



Mastery principles

A mastery curriculum often involves whole-class teaching, with all pupils being taught the same concepts at the same time. Our expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of the pupil's understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving on.

Teaching is underpinned by methodical curriculum design, with units of work that focus in depth on key topics. Lessons and resources are crafted carefully to foster deep conceptual and procedural knowledge. Practice and consolidation play a central-role. Well-designed variation builds fluency and understanding of underlying mathematical concepts in tandem. Teachers use precise questioning to check conceptual and procedural knowledge. They assess in lessons to identify who requires intervention so that all pupils keep up.

How we teach maths at Shire Oak

- Maths is taught daily through a discrete maths lesson of approximately 45 minutes to 1 hour.
- Lessons are planned following the sequence set out for each term on our long term plan.
https://www.shireoak.org/files/ugd/23ebab_cd74ee044fe64962abee789c271850bc.pdf
- Individual units are planned following the White Rose Schemes of Learning to ensure coverage and to ensure careful build-up of progression of knowledge and skills.
- In Reception children have a daily 20 minute whole class session also using White Rose Scheme of Learning overview. This is a practical session using concrete resources which then may be developed with pictorial representations. Teaching is often introduced through the use of books. Songs and rhymes are also used to support learning and practical activities are then in areas of provision throughout the week. This approach is continued into Year 1.
- Small steps are followed in sequence following the White Rose Scheme of Learning with the Notes and guidance, Key questions, Possible sentence stems, National Curriculum links and Things to look out

for sections being the starting point for lesson planning. It is important to note that a small step does not necessarily mean a daily lesson. Some small steps may take several lessons and on occasion, others may be combined.

Introduce parts and wholes

Notes and guidance

In this small step, children begin to think about parts and wholes. While this reinforces and reminds children of what they have learned in Reception, they are unlikely to have been formally introduced to the language of "parts" and "whole".

Ensure time is spent identifying the parts and the whole during activities. Allow children to explore and notice different compositions; for example, 5 can be composed of 2 and 3 or 1 and 4 or 1 and 1 and 3. Encourage children to recognise that numbers can be composed of two or more parts.

At this stage, children should be given the opportunity to explore this concept through play and physical activities. The part-whole model is introduced in the next step.

Key questions

- Where is the whole?
- Where are the parts?
- Is the whole greater than the part? Is the whole always greater?
- Can zero be a part?
- Can the parts be swapped around?

Things to look out for

- Children may make mistakes counting. Encourage children to subitise (to recognise instantly how many objects there are without counting).
- Children may mix up what the parts are and what the whole is. Physical activities can help with this, such as children standing in two hoops to make the parts, then physically coming together to make the whole.

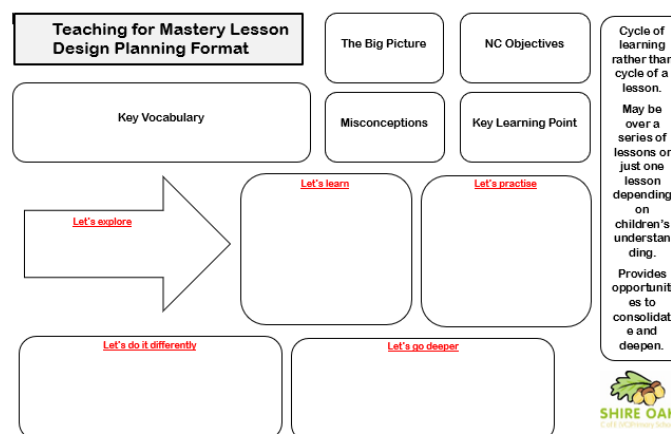
Possible sentence stems

- _____ is a part.
- _____ is a part.
- The whole is _____.
- The whole is _____ than the part.
- There is/are _____ in each part.

National Curriculum links

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer).

- Consolidation and frequent practice of previously learnt skills (including calculation strategies) should be planned for and included, often to begin a lesson including using Flashback 4 (White Rose) or Fluent in Five (Third Space Learning).
- The main lesson input usually follows a familiar lesson structure: Let's explore, Let's learn, Let's practise, Let's do it differently, Let's go deeper. This may be over a series of lessons or just one lesson depending on children's understanding. Some children will need to spend more time on certain aspects.



- Children should be actively involved during teaching input through strategies such as the use of talk partners, use of manipulatives, work on individual whiteboards and use of stem sentences. Pupils will largely be seated in mixed ability places.
- Adaptations should be in place to support the majority of the class to access the learning including learners with SEND and EAL. See appendix – Shire Oak Primary Adaptations to support learners in maths.
- Manipulatives and representations should be a core feature of lessons throughout school from Reception to Year 6.
- Same day/next day intervention should be used regularly to help children who may need additional input.
- All classes should have a maths working wall which includes mathematical vocabulary, stem sentences and visual aids or worked examples specific to the current learning. This should be positioned so that children can refer to it during the lesson to support their learning.
- In addition to the explicit teaching of multiplication facts through the White Rose Scheme of Learning, teachers from Y2 – Y4 will use a whole school approach to teaching of times tables. This will be as a separate daily session of 5-10 minutes outside of the maths lesson.

- Teachers should refer to the Key number facts for their year group and ensure opportunities are given to practise these key skills including as a homework focus. (See appendix)
- Fluency Bee is used in Year 1 and Year 2 for small groups of children who need further support with their fluency of maths facts.
- Where possible, teachers make links to mathematics in other curriculum areas e.g. Measuring in science or DT, statistics in Science etc. and teachers look for opportunities for outdoor learning in maths.

Impact

- Teachers will regularly assess children's learning throughout lessons. Children learn best when assessment informs teaching so that there is provision for support, repetition and extension of learning for each child, at each level of attainment. Assessment opportunities are built into the planning of lessons including the planning of key questions. Teachers can check pupils understanding during lessons using strategies such as questioning; circulating while children are doing paired work and using on the spot marking.
- Carefully chosen questions can help with ongoing assessment. In addition to the questions included in the White Rose Scheme of Learning, sources of questions can be:
 - Diagnostic questions* <https://diagnosticquestions.com/WhiteRose>
 - NCETM Primary Assessment Materials* <https://www.ncetm.org.uk/classroom-resources/assessment-materials-primary/>
 - Nrich* <https://nrich.maths.org/9084>
- Feedback during lessons and through marking mean that teachers are able to plan for same day/next day intervention where children can be helped to understand content they may need further support with.
- End of unit assessments are used at the end of each unit so that teachers can identify areas that the whole class may need further work on and specific areas for individual children. These will then be planned for either as whole class sessions of input for specific groups or individuals.
- At the end of each term (starting from Spring term in Year 2) children will be given a times table check to monitor their progress in learning times tables. These are communicated with parents. (See appendix) The results of these checks will help teachers to identify pupils who will need further support to learn these key facts.
- Children's attainment will be entered on the whole school tracking system three times a year in line with the school's assessment calendar. Teacher assessment and NFER tests will be used to inform these judgements and this information will be shared with parents as part of our system of reporting to parents. Children's progress will also be monitored at these points through pupil progress meetings with class teachers, SLT and the maths subject leader. At this point, children may be identified for further support in maths in the form of intervention which will be recorded on the school's provision map.
- For children who are working below age related expectations, BSquared resources will be used to assess and plan for small steps of progress. This will be in liaison with the SENCo.
- Results of all assessments (summative and formative) will be used to inform planning and provision.

In addition to materials suggested in White Rose Scheme of Learning, the following activities could be used:

Fluency

- *Interactive resources on school system (net apps/interactive resources – Maths Pack, Primary Games, Teaching Time, Teaching Money, Teaching Measures etc.) and web-based games*
- *Games including loop cards, tarsia etc. (There are many pre-made games in resources room, classrooms and KS1 shared area) and songs.*

Reasoning

- *Always, sometimes never*
- *True or False*
- *Which one doesn't belong <https://wodb.ca/>*
- *NonExamples.com*
- *Images - <http://ntimages.weebly.com/>*
- *I like, I don't like*
- *Same, different*
- *Spot the mistake*
- *I notice/I wonder*

Problem Solving

- *NCETM – Primary Assessment Materials - <https://www.ncetm.org.uk/classroom-resources/assessment-materials-primary/>*
- *NCETM – Spine Materials <https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/>*
- *Nrich – see curriculum mapping for each topic https://docs.google.com/spreadsheets/d/1blrdv1M9pKzoKrHeyxT5rkHbJUJJWjYug2k4Xe9_es/edit#gid=598691163*
- *Maths Buzz (BEAM) boxes in classrooms*
- *Grammasaurus - <https://grammarsaurus.co.uk/portal/> (with school log in)*

Appendix: Shire Oak Primary - Adaptations to support learners in maths

- Pre-teaching – vocabulary, basic skills etc.
- Isolate key learning – simplify steps/calculations that are not part of the key learning
- Use of stem sentences that are displayed for children to refer to.
- Key vocabulary related to a topic is displayed and referred to
- Remove language in questions - including goal free problems
- Provide visual prompts – e.g. a worked example, topic specific maths mats
- Reduce variation for those who need to practise fluency
- Encourage talking and paired talk and create an environment that values mistakes
- Help children to make links with previous learning.
- Use of manipulatives
- Use of adults
- Over-learning/repetition/recaps/rehearsing core contents

Key number facts – Shire Oak Primary School



Reception

Say the numbers 0-25 accurately.

Count backwards from 10 (or 20).

Subitise (recognise quantities without counting) up to 5.

Recall number bonds up to 5 (including subtraction facts).

Year 1

Recall number bonds up to 10 (including subtraction facts).

Say one more than numbers to 10.

Say one less than numbers to 10.

Recall doubles of numbers to 5.

Say one more than numbers to 20.

Say one less than numbers to 20.

Add and subtract one-digit numbers to 10 including zero.

Count backwards from 20.

Count to and across 100, forwards and backwards, beginning from any given number.

Count in steps of 2, 5 and 10.

Year 2

Count in steps of 2, 5 and 10.

Recall number bonds up to 20 (including subtraction facts).

Recall doubles of numbers to 10.

Recall halves of doubles to 10.

Say one more than numbers to 100.

Say one less than numbers to 100.

Know multiplication and division facts for 2 x table.

Know multiplication and division facts for 10 x table.

Know multiplication and division facts for 5 x table.

Recognise odd and even numbers.

Add and subtract one-digit numbers to 20 including zero.

Year 3

Find 10 or 100 more than any 2 or 3 digit number.

Find 10 or 100 less than any 2 or 3 digit number.

Know multiplication and division facts for 3 x table.

Know multiplication and division facts for 4 x table.

Know multiplication and division facts for 8 x table.

Year 4

Find 1, 10, 100 or 1000 more or less than a given number (up to 4 digits).

Round any number (up to 4 digits) to the nearest 10, 100 and 1000.

Round numbers with 1 decimal place to the nearest whole number.

Recall multiplication and division facts for multiplication tables up to 12×12

Recall number bonds up to 100 (including subtraction facts).

Recognise decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.

Year 5 and 6

Recall multiplication and division facts for multiplication tables up to 12×12

Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000.

Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.

Establish whether a number up to 100 is prime and recall prime numbers up to 19.

Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3).

Recall doubles of any 2 digit number.

Recall halves of any even 2 digit number.

Multiply and divide whole and decimal numbers by 10, 100 and 1000.

Recognise decimal (and percentage) equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.



Year 2 Times Tables

Your child will be working on the following times tables in school. Please help your child to learn these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Counting in 2s, 5s and 10s
Autumn 2	Counting in 2s, 5s and 10s
Spring 1	X 10
Spring 2	X 2
Summer 1	X5
Summer 2	X2 X5 X10



Year 2 Times Tables

Your child will be working on the following times tables in school. Please help your child to learn these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Counting in 2s, 5s and 10s
Autumn 2	Counting in 2s, 5s and 10s
Spring 1	X 10
Spring 2	X 2
Summer 1	X5
Summer 2	X2 X5 X10



Year 3 Times Tables

Your child will be working on the following times tables in school. Please help your child to learn these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Consolidation of x2 x5 and x10
Autumn 2	X 3
Spring 1	X 4
Spring 2	X 8
Summer 1	X3 X4 X8
Summer 2	X3 X4 X8



Year 3 Times Tables

Your child will be working on the following times tables in school. Please help your child to learn these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Consolidation of x2 x5 and x10
Autumn 2	X 3
Spring 1	X 4
Spring 2	X 8
Summer 1	X3 X4 X8
Summer 2	X3 X4 X8



Year 4 Times Tables

Your child will be working on the following times tables in school. Please help your child to learn these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Consolidation of x3 x4 and x8
Autumn 2	X 6
Spring 1	X 7
Spring 2	X 9
Summer 1	X 11 X 12
Summer 2	Consolidation of all facts to 12 x 12



Year 4 Times Tables

Your child will be working on the following times tables in school. Please help your child to learn these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Consolidation of x3 x4 and x8
Autumn 2	X 6
Spring 1	X 7
Spring 2	X 9
Summer 1	X 11 X 12
Summer 2	Consolidation of all facts to 12 x 12



Year 5 Times Tables

By Year 5/6 children have been taught all of their times table facts to 12×12 . Across the year we will go over them to make sure they are secure. Please help your child to practise these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Consolidation of $\times 4$ and $\times 8$ (and all previous)
Autumn 2	Consolidation of $\times 3$ and $\times 6$ (and all previous)
Spring 1	Consolidation of $\times 9$ and $\times 7$ (and all previous)
Spring 2	Consolidation of $\times 11$ and $\times 12$ (and all previous)
Summer 1	Consolidation of all facts to 12×12
Summer 2	Consolidation of all facts to 12×12



Year 5 Times Tables

By Year 5/6 children have been taught all of their times table facts to 12×12 . Across the year we will go over them to make sure they are secure. Please help your child to practise these at home as part of their homework. They will be tested at the end of each term.

Autumn 1	Consolidation of $\times 4$ and $\times 8$ (and all previous)
Autumn 2	Consolidation of $\times 3$ and $\times 6$ (and all previous)
Spring 1	Consolidation of $\times 9$ and $\times 7$ (and all previous)
Spring 2	Consolidation of $\times 11$ and $\times 12$ (and all previous)
Summer 1	Consolidation of all facts to 12×12
Summer 2	Consolidation of all facts to 12×12