Parklands
Educate Together

# Mathematics in Year Five

## A guide for parents

*Learn Together to Live Together*

This guide is designed to inform families of how Maths is taught and how to support at home. It has been created using guides from White Rose Mathematics to support.

## What is our approach to mathematics?

At Parklands Educate Together, we use a scheme called White Rose Maths. This is a mastery-based approach aligned to the aims and objectives of the National Curriculum. It is rooted in the belief that all children can achieve in Mathematics.

## Putting Number First

The White Rose scheme has number at its heart, and a significant amount of time is spent reinforcing number so that children can confidently access the rest of the curriculum.

## Depth before Breadth

We ensure that children have a deep understanding of concepts, rather than rushing on. Opportunities to revisit previously learned skills are built into later blocks of learning.

## Fluency, reasoning and problem solving

The White Rose scheme develops these three areas to ensure children have the knowledge and skills they need to become confident mathematicians.

## Concrete, Pictorial, Abstract

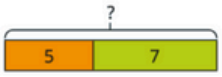
Research shows that all children, when introduced to a new concept, should have the opportunity to build competency using the concrete, pictorial, abstract approach. This features throughout the schemes of learning.

*Concrete*

Children should have the opportunity to work with physical objects/concrete resources, in order to bring the maths to life and to build understanding of what they are doing.

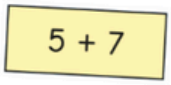
*Pictorial*

Alongside concrete resources, children should work with pictorial representations,
making links to the concrete. Visualising a problem in this way can help children to reason and to solve problems.




*Abstract*

With the support of both the concrete and pictorial representations, children can develop their understanding of abstract methods.




<u>This Booklet</u>

The aim of this booklet is to give you, as parents, a better understanding of the key concepts your child will be learning and how they are taught. It provides ideas and resources so you can support your child at home. This booklet is available to download from the curriculum section of our website, with elements hyperlinked so you can easily access the resources.

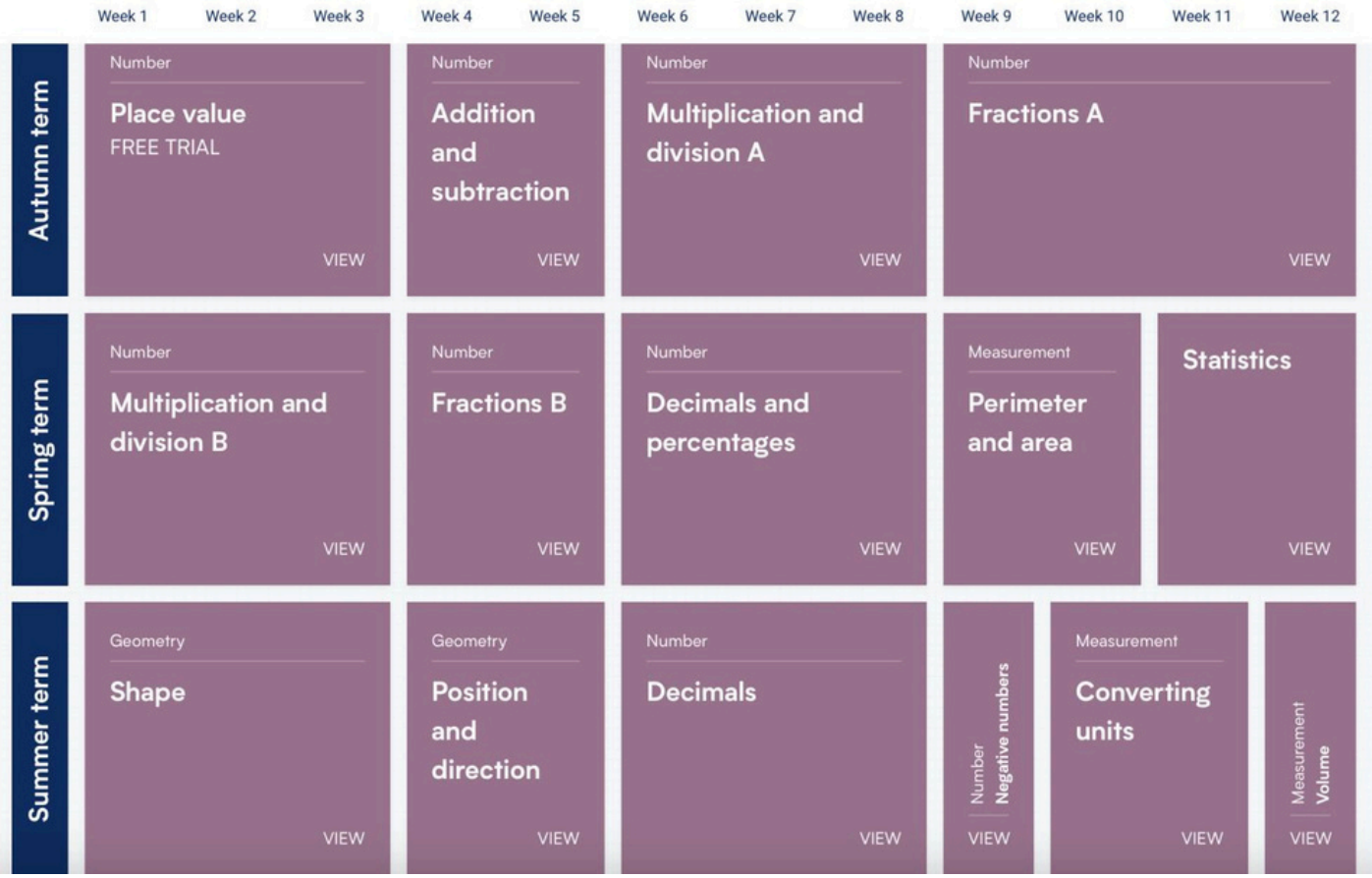
<u>What will my child learn in mathematics this year?</u>

Overleaf is an overview of the maths that your child should be learning at any point in the year. You'll notice that the White Rose scheme spends lots of time building strong number skills in Key Stage 1 and Key Stage 2. These essential core skills lay a solid foundation for more complicated learning later on.

Sometimes the class might be a little behind or ahead of the scheme schedule. That's fine; White Rose deliberately build flexibility into their schemes to allow for this. You can check the year group medium term planner on the class page for further information.

## Year Five Overview

Click the image below to link to the White Rose website. This will give you more information on the small steps that are taught in each of these blocks.




## Progression of Skills

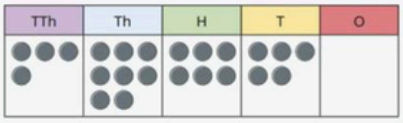
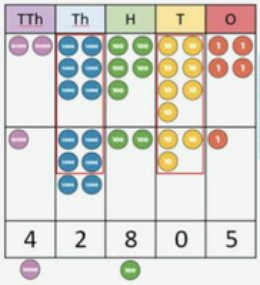
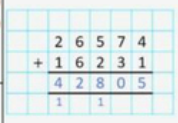
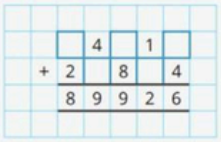
White Rose is a very carefully planned scheme of work. Overleaf, you can see an overview of how key skills are taught for addition, subtraction, multiplication and division. concrete, pictorial, abstract approach.

It also includes some sentence stems and key questions that we use to help children.

You may also find the 'Maths with Michael – Parent Guide' videos and downloadable parent guides on the White Rose website useful. These give a broad overview for parents of place value, subtraction, multiplication, division, fractions and algebra.

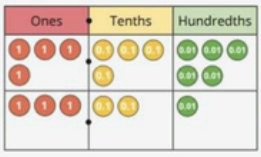
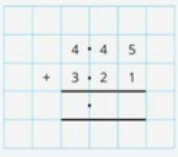
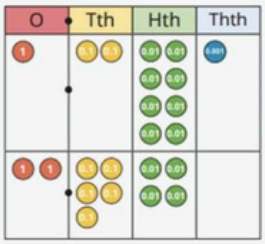
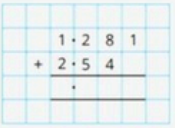
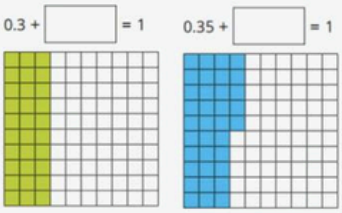
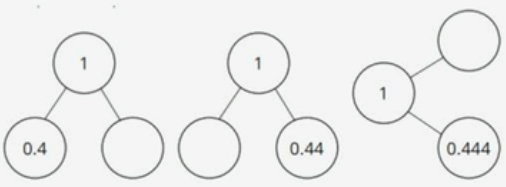
# Addition

White Rose MATHS

| Year 5 | • Add whole numbers with more than 4 digits, including using formal written methods.<br>• Add numbers mentally with increasingly large numbers.<br>• Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1<br>• Add fractions with the same denominator, and denominators that are multiples of the same number. |
|---|---|
| **Progression of skills** | **Key representations** |
| **Add using mental strategies**<br><br>Add 1s, 10s, 100s, etc. to any number.<br>Use number bonds and related facts. |  <br><br>48,650 + 300 =<br>48,650 + 30,000 =<br>48,650 + 30 = |
| | To add ..., I can add ... then subtract ...<br>  <br> |
| **Add whole numbers with more than 4 digits**<br><br>Encourage children to estimate and use inverse operations to check answers to calculations. | I can exchange 10 ... for 1 ...<br>  <br><br>  <br><br>  <br> |

# Addition

White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Add decimals with up to 2 decimal places**<br><br>Progress from the same number of decimal places to a different number of decimal places, and from no exchange to exchange. | I do/do not need to make an exchange because ...<br>I can exchange 10 ... for 1 ...<br>  <br><br>  <br><br>  <br><br>  <br> |
| **Complements to 1**<br><br>Pairs of numbers with up to 3 decimal places which total 1<br><br>Encourage children to make links with bonds to 10 and complements to 100 and 1,000 |  <br><br>  <br><br>  <br><br>4 + 6 = 10<br>44 + 56 = 100<br>444 + 556 = 1,000<br>0.4 + 0.6 = 1<br>0.44 + 0.56 = 1<br>0.444 + 0.556 = 1 |

Fluency Friday

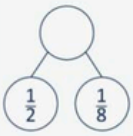
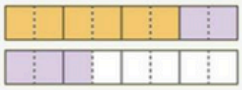
Every Friday across the school, each year group takes part in Fluency Friday wherein children are encouraged to practice the foundational skills that make up mathematic fluency.

In Year 5, this takes the form of times tables in Term 1, 2 and 3. It is essential that they have a firm understanding of their key facts at this stage to allow them to access the new Year 5 content with minimal resistance. From Term 4, they begin to do arithmetic papers that reflect the key learning for Year 5 in a format that reflects the SATs at the end of Year 6. This gives them adequate preparation for the following year while also ensuring that they practice key operations and procedures in their year group.

We continuously check their progress in these times table and arithmetic papers, using their scores to do in the moment interventions and ensure we know where they are in their learning journey at all times.

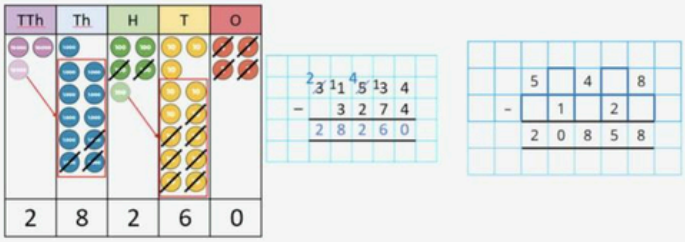
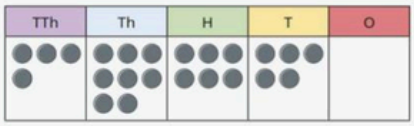
# Addition

White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Add fractions with denominators that are a multiple of one another**<br><br>Encourage children to convert fractions to the same denominator before adding.<br><br>Progress from adding fractions within 1 whole to adding fractions beyond 1 whole. | The denominator has been multiplied by …, so the numerator needs to be multiplied by… for the fractions to be equivalent.<br><br>  <br>  <br>$\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$<br><br>  <br>$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$<br><br>  <br>  <br>$\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$ |

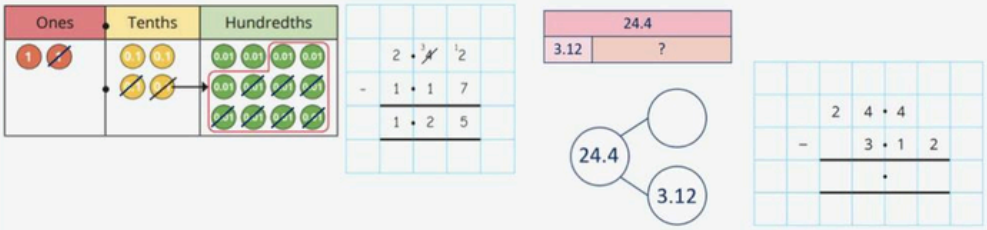
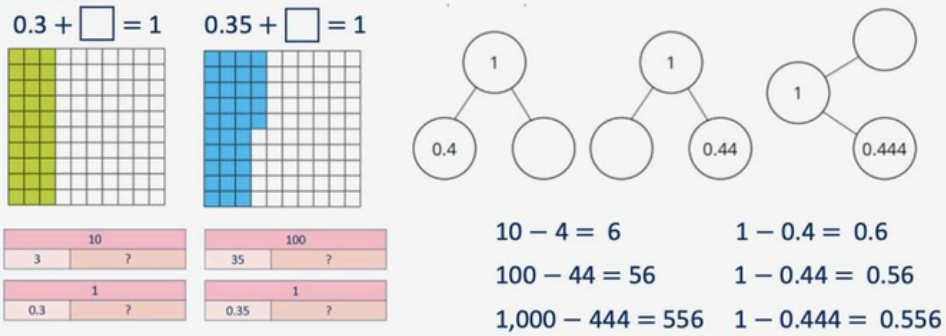
# Subtraction

White Rose MATHS

| Year 5 | • Subtract whole numbers with more than 4 digits.<br>• Subtract numbers mentally with increasingly large numbers.<br>• Subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1<br>• Subtract fractions with the same denominator, and denominators that are multiples of the same number. |
|---|---|
| **Progression of skills** | **Key representations** |
| **Subtract whole numbers with more than 4 digits**<br><br>Encourage children to estimate and use inverse operations to check answers to calculations. | I can exchange 1 … for 10 …<br><br>  <br> |
| **Subtract using mental strategies**<br><br>Subtract 1s, 10s, 100s etc from any number.<br>Use number bonds and related facts. |  <br><br>48,650 − 300 =<br>48,650 − 30,000 =<br>48,650 − 30 = |
| | To subtract …, I can subtract … then add …<br><br>  <br> |

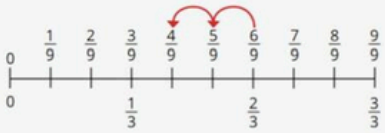
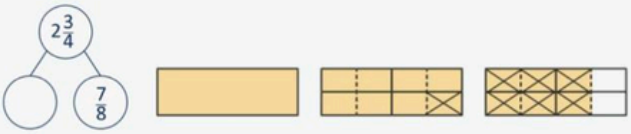
# Subtraction

White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Subtract decimals with up to 2 decimal places**<br><br>Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange. |  |
| **Complements to 1**<br><br>Encourage children to make links with bonds to 10 and complements to 100 and 1,000 when finding a missing part or subtracting from 1 |  <br>$10 - 4 = 6$ $\quad 1 - 0.4 = 0.6$<br>$100 - 44 = 56$ $\quad 1 - 0.44 = 0.56$<br>$1{,}000 - 444 = 556$ $\quad 1 - 0.444 = 0.556$ |

# Subtraction

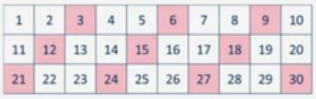
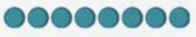
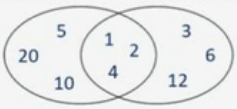
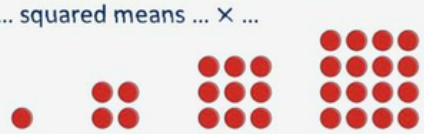
White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Subtract fractions with denominators that are a multiple of one another**<br><br>Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number. | The denominator has been multiplied by …, so the numerator needs to be multiplied by… for the fractions to be equivalent.<br>  <br>$\frac{1}{3} - \frac{1}{15} = \frac{5}{15} - \frac{1}{15} = \frac{4}{15}$<br>  <br>$\frac{2}{3} - \frac{2}{9} = \frac{6}{9} - \frac{2}{9} = \frac{4}{9}$<br>  |

# Multiplication

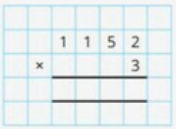
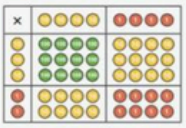
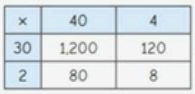
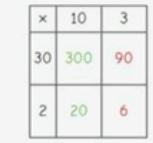
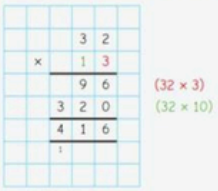
White Rose MATHS

| Year 5 | • Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers<br>• Recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$)<br>• Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.<br>• Multiply numbers mentally drawing upon known facts.<br>• Multiply whole numbers and those involving decimals by 10, 100 and 1000<br>• Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. |
|---|---|

| Progression of skills | Key representations | | |
|---|---|---|---|
| **Multiples and factors**<br><br>Encourage children to notice patterns and make links with known facts. | … is a multiple of … because … × … = …<br>  <br>  <br> | … is a factor of … because … × … = …<br>  <br>1 × 8<br>  <br>2 × 4<br>1, 2, 4 and 8 are factors of 8 | The common factors of … and … are …<br>Factors of 20 Factors of 12<br>  <br> |
| **Square and cube numbers** | … squared means … × …<br>  <br>1 × 1 $1^2 = 1$<br>2 × 2 $2^2 = 4$<br>3 × 3 $3^2 = 9$<br>4 × 4 $4^2 = 16$ | … cubed means … × … × …<br>  <br>1 × 1 × 1 $1^3 = 1$<br>2 × 2 × 2 $2^3 = 8$<br>3 × 3 × 3 $3^3 = 27$ | |

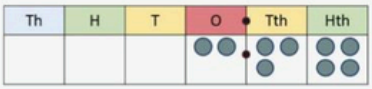
# Multiplication

White Rose MATHS

| Progression of skills | Key representations | |
|---|---|---|
| **Multiply numbers up to 4 digits by a 1-digit number**<br><br>This builds on the short multiplication method introduced in Y4 | To multiply a 4-digit number by … , I multiply the ones by … , the tens by … , the hundreds by … and the thousands by …<br>  <br><br>  <br> | |
| **Multiply numbers up to 4 digits by a 2-digit number**<br><br>Numbers are first partitioned using an area model then long multiplication is introduced for the first time. | I can partition … into … and …<br>  <br>  <br><br>$32 \times 44 = 1{,}200 + 80 + 120 + 8$<br>$32 \times 44 = 1{,}408$ | First, I multiply by the … Then I multiply by the …<br>  <br><br>300 + 90 + 20 + 6 = 416<br>  <br> |

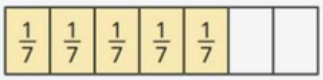
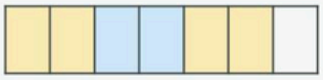
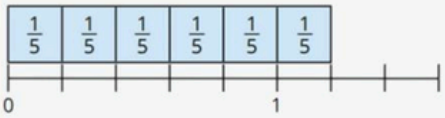
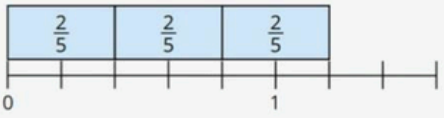
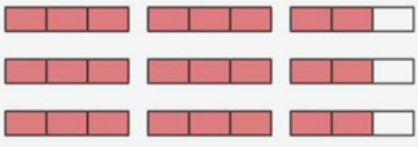
# Multiplication

White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Multiply by 10, 100 and 1,000**<br><br>Some children may over-generalise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals. | To multiply by 10/100/1,000, I move all the digits … places to the left.<br>… is 10/100/1,000 times the size of …<br><br>  <br><br><br>  <br><br><br>$234 \times 10 = 2{,}340$<br>$234 \times 100 = 23{,}400$<br>$234 \times 1{,}000 = 234{,}000$<br><br>$2.34 \times 10 = 23.4$<br>$2.34 \times 100 = 234$<br>$2.34 \times 1{,}000 = 2{,}340$ |
| **Mental strategies**<br><br>Children continue to use efficient mental strategies such as partitioning and knowledge of factor pairs and related facts to multiply. | The most efficient strategy to calculate … × … is …<br>To calculate … × 12, I can do … × … × …<br><br>For example: 121 × 12<br>I could calculate 100 × 12 plus 20 × 12 plus 1 × 12<br>I could calculate 121 × 10 plus 121 × 2<br>I could calculate 121 × 6 × 2<br>I could calculate 121 × 4 × 3 |

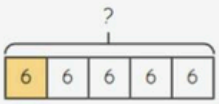
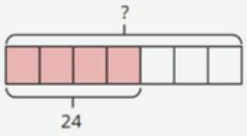
# Multiplication

White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Multiply fractions by a whole number**<br><br>Make links with repeated addition.<br>E.g. $\frac{1}{5} \times 4 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$ | To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same.<br><br>  <br><br><br>$\frac{1}{7} \times 5 = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{5}{7}$<br><br>  <br><br>$\frac{2}{7} \times 3 = \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{6}{7}$<br><br>  <br><br><br>$\frac{1}{5} \times 6 = \frac{6}{5} = 1\frac{1}{5}$<br><br>  <br><br><br>$\frac{2}{5} \times 3 = \frac{6}{5} = 1\frac{1}{5}$ |
| **Multiply mixed numbers by a whole number** | I can partition  into  and  <br><br>  <br><br>$2\frac{2}{3} \times 3$<br>$2 \times 3 = 6$ $\quad \frac{2}{3} \times 3 = \frac{6}{3} = 2$<br>$2\frac{2}{3} \times 3 = 6 + 2 = 8$ |

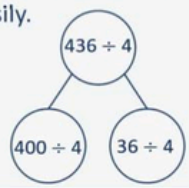
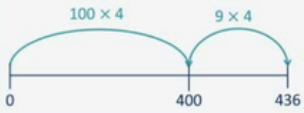
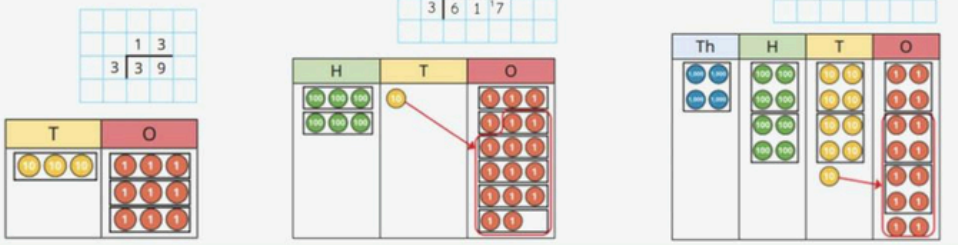
# Multiplication

White Rose MATHS

| Progression of skills | Key representations | |
|---|---|---|
| **Find the whole**<br><br>Children multiply to find the whole from a given part. | If $\frac{1}{\square}$ is … , then the whole is … × … | If $\frac{\square}{\square}$ is … , then $\frac{1}{\square}$ is … and the whole is … × … |
| | $\frac{1}{5}$ of ___ = 6<br>  <br><br>$5 \times 6 = 30$<br>$\frac{1}{5}$ of **30** = 6 | $\frac{4}{7}$ of ___ = 24<br>  <br><br>$\frac{1}{7} = 24 \div 4 = 6$<br>$7 \times 6 = 42$<br>$\frac{4}{7}$ of **42** = 24 |

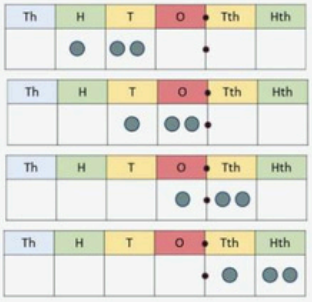
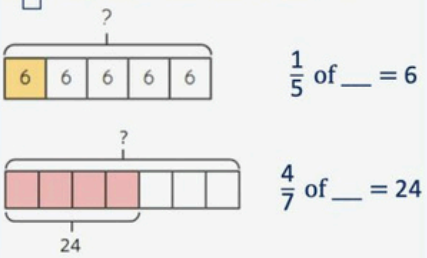
# Division

White Rose MATHS

| Year 5 | • Divide numbers mentally drawing upon known facts.<br>• Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.<br>• Divide whole numbers and those involving decimals by 10, 100 and 1,000 | | |
|---|---|---|---|
| **Progression of skills** | **Key representations** | | |
| **Mental strategies** | I can partition … into … and … to help me to divide more easily.<br>  <br> | I can show groups of … on a number line.<br>  <br> | To divide by …, I can divide by … and then divide the result by …<br>$436 \div 4 = 436 \div 2 \div 2$<br>$436 \div 2 = 218$<br>$218 \div 2 = 109$ |
| **Divide numbers up to 4 digits by a 1-digit number**<br><br>The short division method is introduced for the first time. | There are … groups of … hundreds/tens/ones/ in …<br>I can exchange 1 … for 10 …<br>  <br> | | |

# Division

White Rose MATHS

| Progression of skills | Key representations |
|---|---|
| **Divide by 10, 100 and 1,000**<br><br>Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times. | To divide by 10/100/1,000, I move all the digits ... places to the right.<br>... is one-tenth/one-hundredth/one-thousandth the size of ...<br>  <br>$120 \div 10 = 12$<br>$120 \div 100 = 1.2$<br>$120 \div 1{,}000 = 0.12$ |
| **Fraction of an amount**<br><br>Bar models support children to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator. | To find $\frac{\square}{\square}$ of ... , I need to divide by ...<br>and multiply by ...<br>  <br>$\frac{1}{5}$ of 20 =<br>$\frac{3}{5}$ of 20 =<br>$\frac{1}{4}$ of 84 =<br>$\frac{3}{4}$ of 84 =<br>If $\frac{1}{\square}$ is ... , then the whole is ... × ...<br>  <br>$\frac{1}{5}$ of ___ = 6<br>$\frac{4}{7}$ of ___ = 24 |

## Times Table Fluency

We want all our children to love maths and succeed. Children who can recall facts enjoy and are able to secure the maths curriculum easier than the children who can't recall these facts. There are not many facts: 36 'building block' facts (up to 9 x 9). There are roughly 39 weeks in a school year, equating to essentially 1 fact a week, every year. It is achievable for the vast majority of children to learn these facts. We have a systematic, whole class approach to learning times tables which breaks down the learning of times tables into manageable chunks. We teach little and often, including Fluency Friday where we focus on the mathematic fluency needed (times tables included).

## The Process

Children learn each number sentence as a memorised phrase by repeating the sound pattern out loud. They learn each fact one way round only. We always state the larger number first. The children very quickly become attuned to this and it just helps in the learning process.

4 x 6 = becomes ‘six fours are twenty-four’.

We learn one new fact at a time. We will look at 6x6=36 one day, then 7 x 6 = the following day.

We don’t want children to think. We want them to become known facts. This is why, during the quiz, we have the times tables answers on the board.

## How we assess your child

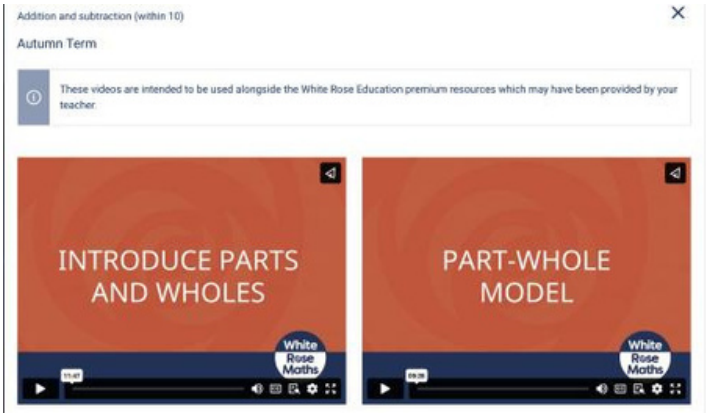
Each term, we use Times Tables Rockstars to help assess the gaps. The children take part in a ‘gig’, which then produces a heatmap. This shows us which facts the child knows well, and which they need to work on. We send this home to families so that the children can practice the facts they aren’t able to recall at home.

It is essential that your child uses Times Tables Rockstars at home to embed these facts and continue to practice them. This online resource is tailored to the individual child, and it’s algorithm will workout which facts your child knows, and which they need to practice more.

Click the image below to find out more about the different game types and how they support your child.


## How to Support your child

There are a wide range of materials and resources available to support your child with their maths at home. In Key Stage Two, the expectation is that children practice their times tables fluency. The medium term planner on the class page will support you with the current focus. Below are some ideas to support, as well as other resources that can be used if your child is finding an aspect of maths tricky. Pictures below are hyperlinked for ease. White Rose Home Learning Videos These are provided for each small step and are 8 – 10 minutes long. These can be useful to reconsolidate learning that your child may find tricky. Clicking on the individual block will then show you the different videos.




## White Rose Home Workbooks

White Rose provide some printable workbooks for each block that can be used at home. They also have a Kindle edition.

White Rose One-Minute App

This app is great for short one-minute daily practice on adding, subtraction, subitising, multiplication and division skills. It is free to download on iOS, amazon and android devices.

Times Tables Rockstars

Times Tables Rockstars (or TTRS), is highly individualised for each child to support them to practise the facts they need. It has a variety of timed and non-timed games.

MathsBot Arithmetic and Reasoning Practice

MathsBot.com

MathsBot is an excellent revision resource that will be used frequently in later terms for Fluency Fridays. It creates randomised arithmetic and reasoning papers that mimic the Year 6 SATs paper but with year group specific learning. You can regenerate the resources as many times as you like which makes it useful continuously. The answers are also included in the pdf.

For those with children who may have gaps further back in the KS2 curriculum, there are also arithmetic resources for Year 3, 4.