



# Spotlight on Maths



## How we teach Maths at WTW

### What do we want the children to achieve in Maths?

Maths is an essential skill to have in everyday life and it is a subject that is given high importance. Children receive daily maths lessons that focus on developing their confidence working with numbers, but also covering areas such as shape, space, measures and data handling. We follow a Maths Mastery approach which follows the White Rose scheme.

#### Our intent:

1. For children to independently progress through the maths mastery stages of calculate, apply and think in each lesson or sequence of lessons:  
**Calculate:** for children to establish a concrete understanding of each mathematical strategy.  
**Apply:** for children to have the confidence to apply each mathematical strategy when questions are presented in various ways.  
**Think:** for children to independently solve problems across a range of contexts and to share increasingly precise mathematical reasoning.
2. For the children to be able to justify mathematical reasoning through using appropriate mathematical vocabulary and terminology.
3. For children to confidently access practical and visual resources which support mathematical understanding.

### Key Principles of a Maths Mastery Approach

The expectation is that the **majority of pupils will move through the programmes of study at broadly the same pace**. Children who find a concept difficult to be given additional support.

Pupils who grasp concepts rapidly should be **challenged through being offered rich and sophisticated problems** before any acceleration through new content: depth not acceleration.

**Puts numbers first:** White Rose Maths Mastery has number at its heart - confidence with numbers is the first step to competency in the curriculum as a whole.

**Vocabulary:** Using the correct maths vocabulary is an essential part of every lesson, and it underpins our mastery approach. When children are using mathematical talk to explain their answers, thinking or reasoning, it demonstrates whether or not they have fully understood, or 'mastered' the learning intention.

**Focuses on fluency, reasoning and problem solving:** It gives children the skills they need to become competent mathematicians.

**Concrete Pictorial Abstract:** At the heart of our mastery approach is the Concrete Pictorial Abstract (CPA) approach. Research shows that when children are introduced to a new concept, working with concrete physical resources and pictorial representations leads to a better understanding of abstract concepts. We use CPA throughout our schemes of learning.



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### What do maths lessons in the Early Years look like?

Children in the Early Years develop firm mathematical foundations through engaging lessons. We recognise that a positive relationship with mathematics will encourage children to develop the thinking, reasoning and problem-solving skills needed to succeed throughout their time at school. We combine 15 minute daily lessons (in Reception these follow the White Rose scheme) with an enabling mathematical environment that allows children to explore concepts independently. After each lesson, the teacher will work with small groups to assess their mastery of a concept. Each child will have one small group session with the teacher and one with their Teaching Assistant every week, as well as the many other learning opportunities around the classroom.

To prepare the children for Year 1-6, our teaching follows the principles of Maths Mastery. Children who learn a skill quickly are challenged to think in greater depth, rather than moving on to a new topic or simply working with bigger numbers. We know that children have achieved mastery of a concept when they can explain their learning to us, so we ensure they have lots of time to show off their developing mathematical vocabulary!

### What do maths lessons in KS1 and KS2 look like?

In Years 1 to 6, the children have a daily maths lesson of between 45 minutes to one hour, depending on their age. This normally takes place in the morning.

Lessons always start with a 'flashback' activity: an opportunity for children to recall, practice and consolidate some of their previous learning (from yesterday/ earlier in the week, from previous units, or even from previous years).

The White Rose scheme has a real focus on depth of learning and ensuring that the children are really secure in their knowledge and understanding before they move on. Lessons typically involve a short whole class teacher input and then the majority of the time working independently or collaboratively on maths tasks. A typical lesson, or sequence of lessons, will involve most children going through three stages of learning.

### The Stages of Each Maths Lesson or Sequence of Lessons (Year 1 to 6)

As mentioned earlier, we divide the learning into three key areas:

**Calculate** – this is where the children are given the opportunity to practise the skills being taught

**Apply** – this is where the children are given problems to solve in a variety of contexts, using the skills taught, giving pupils a richer and deeper learning experience. Pupils combine different concepts to solve complex problems, and apply knowledge to real-life situations.

**Think** – these questions require a deeper level of understanding and thought. Pupils explain the mathematics in full sentences. They should be able to say not just what the answer is, but how they know it's right. This is key to building mathematical language and reasoning skills.

On the next page are some examples of questions for each stage.



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## Example of Calculate style questions

### Calculate

1 a) What method would you use to solve each of these divisions?

$4,080 \div 10$        $4,080 \div 24$   
 $4,080 \div 4$        $4,080 \div 34$

Talk about it with a partner.

b) Complete the calculations.

$4,080 \div 10 = \square$        $4,080 \div 4 = \square$

$4,080 \div 24 = \square$        $4,080 \div 34 = \square$

2 Use these multiples of 37 to complete the long divisions.

37	74	111	148	185	222	259	296	333
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37	4	0	7	0					
37	3	9	5	9					

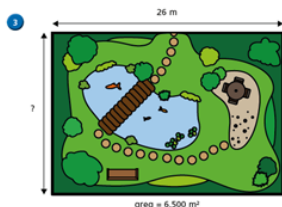
### Calculate

Copy and answer these in your books

2526 rounded to the nearest 1000 is  
 7234 rounded to the nearest 1000 is  
 9355 rounded to the nearest 1000 is  
 8590 rounded to the nearest 1000 is  
 2864 rounded to the nearest 1000 is  
 5645 rounded to the nearest 1000 is  
 8750 rounded to the nearest 1000 is  
 1429 rounded to the nearest 1000 is  
 6982 rounded to the nearest 1000 is  
 9374 rounded to the nearest 1000 is

## Example of Apply style questions

### Apply



What is the width of this garden?

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### Apply 1

Circle all the numbers that round to 38,000 to the nearest 1,000

38,350      38,499      37,500      38,500  
 37,690      37,099      37,999      38,098

4

A bag of guinea pig food holds 2.375 kg of food.  
 It needs to last for 19 days.  
 How much food can the guinea pig have each day?





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## Example of Think style questions

Think



Use each digit card once to complete the division in different ways.

$$\square\square\square \div \square\square$$

Experiment to find divisions that give:

- a) the smallest possible remainder
- b) the greatest possible remainder
- c) a remainder that is a multiple of 5

Caroline's daughter has an age that is a cubed number.

Next year her age will be a squared number.

How old is she now?

The area of a rectangle will always be more than the perimeter. True or False?

## Example of Think style questions

Scott scores 20 out of 24 in a game.

Dani scores 5 out of 7

Compare their scores.

Explain who you think did better and why.

Are the statements always, sometimes or never true?

An even number has an even number of factors.

An odd number has an odd number of factors.

Max, Amir and Whitney are trying to work out which is the greatest fraction.

$$\frac{3}{7} \quad \frac{13}{21} \quad \frac{5}{11}$$



I am going to find a common denominator.

Max

I am going to find a common numerator.



Amir



I am going to compare each of them to  $\frac{1}{2}$  to help me.

Whitney

Whose method do you prefer?

Explain your reasons.

Think 2

Richard says that  $6 + 4 \times 9 = 90$   
Is he correct? Explain your answer.

Think 3

Using the numbers 3, 4 and 5 and the operations +, -,  $\times$  and  $\div$ , make as many different numbers as possible.



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## Mastering Number Sessions in Reception and Year 1

This programme, called “Mastering Number” is aimed at strengthening the understanding of number, and fluency with number facts, among children in the first two to three years of school. Children in Reception and Year 1 have this each day in addition to their main Maths lesson.

This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

## How do we ensure that children are challenged?

It is expected that every child will master key concepts, whilst some will work more deeply on challenging tasks. Differentiation comes in a variety of ways. It might be through the amount of time children will spend using concrete resources to grasp concepts, for example. For higher attaining children, challenge is presented through more demanding problems, which deepen their knowledge of the same content. Some children may skip the calculate stage if they are showing a high level of understanding and confidence in the area of maths being studied, so that they can spend a greater amount of time on the more challenging apply and think questions which will aim to really stretch them. Further differentiation will be seen through targeted questioning, scaffolding and support as they work through problems. Depth of understanding and readiness for the next stage (whether it is the next lesson, next unit of work, year or key stage) is prioritised, alongside high expectations of every child.

