

# Maths



10/5/2021



Pinner Wood School

# Maths Inset

# PW Way!

## What we will be going over today:

- Summary of the findings for the book look
- Mental maths
- Maths lesson structure
- Hot and cold tasks
- Planning/ marking
- White Rose Maths
- Maths passports/ timestables rockstars
- Questions



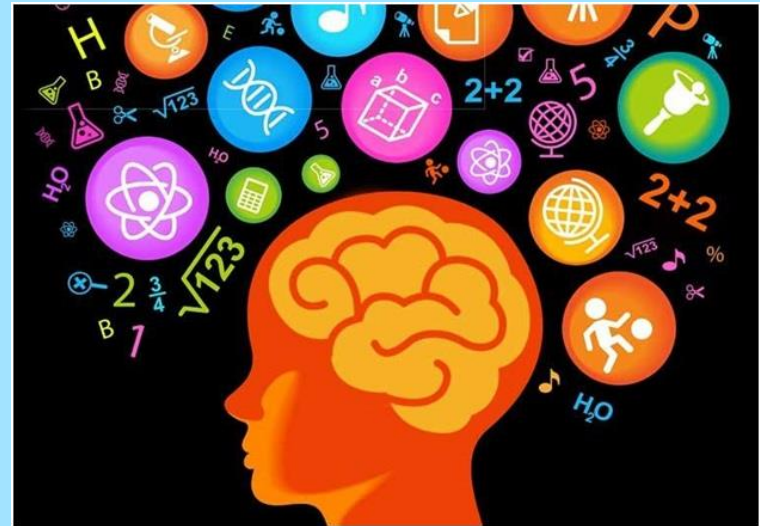
# Summary of Maths

## Strengths:

- Mastery challenge embedded in all year groups in all lessons
- Good presentation of books
- Agreement in moderation of attainment
- Hot and cold task attempted by all year groups
- A range of activities in books
- Children working towards appropriate L.O's

## Next Steps

1. Opportunities for quick maths recall skills
2. Hot and Cold task (delivery and sheet)
3. Marking ( green and yellow comments)



# Mental Maths

In order to help with better recall and fluency we will put back a 'mental maths' warm up for a starter. The changes will be as follows:



Tuesday - Basic skills

Wednesday - Mental maths

Thursday - Mental maths - Rapid recall

E.g Verbally ask the children a range of questions.

Use of digit cards.

Loop card games

If children have struggled with a concept from the previous day plan it as a part of your mental maths starter.

Also it is a great opportunity to recap and revise concepts.



# Maths lesson structure

Each lesson has been designed to meet the criteria of the new Maths framework

Monday

Hot task

Main lesson

Plenary

Wednesday

Mental maths/ rapid recall

Main lesson

Maths mastery -linked to the lesson

Friday - Reasoning lesson

Linked to your weeks objectives

Maths passports (do this once a week whenever you can)

Tuesday

Basic skills

Main lesson

Maths mastery -linked to the lesson

Thursday

Mental maths skills

Main lesson

Maths mastery -linked to the lesson

Also to include:

Cold task to be completed before your planning day





# Maths National Curriculum

## Aims

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 non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

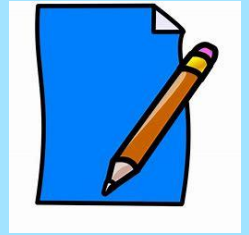
Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

Basic skills and  
Times tables rockstars

Doing this daily

Fridays lesson as  
well as interlinking  
with the daily  
reasoning

# Hot and cold tasks



We brought this in to help us inform our planning and use as an assessment.

Maths Topic:  
Fractions- Cold task

Learning Objectives covered:

<u>-Key Vocabulary:</u> Fraction, part, denominator, numerator
LO: To add fractions with the same denominator.
LO: To subtract fractions with the same denominator.
LO: Use factors and multiples to recognise equivalent fractions

Challenge 1:

1.  $\frac{2}{7} + \frac{3}{7} = \square$

2.  $\frac{2}{10} + \frac{4}{10} + \frac{3}{10} = \square$

Challenge 2:

$\frac{4}{\square} = \frac{\square}{8}$

Challenge 3:

a)  $\frac{1}{4}$  of 20 =  $\square$

20

?

- Cold task to be completed a week before the unit so that planning can be done accordingly.

- Give some verbal input - if children are really struggling. This may be more so in KS 1.

- KS1 can have a practical cold task. Please take a photo and upload this/stick it i

- Short, sharp and quick. It is a quick assessment of the unit.

- Do the cold task when you think is a good opportunity to do it.

- Use a timer for 10 mins - so that we can see the fluency.

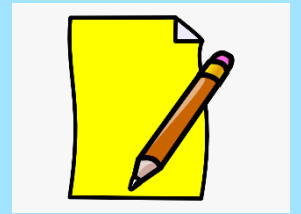
- Children complete what they can from it. It doesn't matter if they don't complete the whole thing. Stress the importance of having a go and moving on to the next question if stuck.

Adapted for SEN/LA/KS 1

Children can be given a verbal question, practical activity.  
Teacher to make that judgement.



# Hot and cold tasks



Maths Topic:

Angles- Hot Task

Learning Objectives covered:

<p><b>-Key Vocabulary:</b> Degrees, straight line, full circle, right angle, obtuse, reflex, acute 180 degrees</p>
LO - To be able to identify obtuse and acute angles.
LO - To be able to identify acute and obtuse angles in 2D shapes.
LO - To be able to order and compare angles up to two right angles by size.

Challenge 1:

1) Circle the obtuse angles:

A diagram showing four different angles. The first is an acute angle, the second is a right angle, the third is an obtuse angle, and the fourth is a reflex angle. A speech bubble icon is in the top right corner.

Challenge 2:

1) Order these angles from smallest to largest by labelling them from 1-4.

A diagram showing four angles of different sizes. Below each angle is a small square box for labeling. A speech bubble icon is in the top right corner.

Challenge 3:

1) Which angle is the odd one out?  
Explain your answer in your book.

A diagram showing four angles: two acute, one obtuse, and one reflex. A speech bubble icon is in the top right corner.

2) Romesh says, "A triangle can have two obtuse angles."  
Is he correct? \_\_\_\_\_  
Prove it in your book.

Hot task to be completed on the Monday KS2 in your Maths lesson.  
Stick into your books and mark.

This will replace your long comments writing.  
Add in 1 encouraging word.

Ensure again that it is short and straight forward.  
(6 -7 mins max)

KS1 - Complete this on Friday  
KS2 - Complete on the Monday

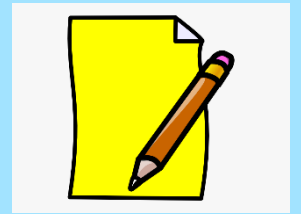
1 calculation 1 reasoning - 3 challenges  
Purple pen for children that have not understood it.



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# 3. Marking



**Maths Topic:**  
**Angles- Hot Task**

Learning Objectives covered:

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**Challenge 1:**

1) Circle the obtuse angles:

**Challenge 2:**

1) Order these angles from smallest to largest by labelling them from 1-4.

**Challenge 3:**

1) Which angle is the odd one out?  
Explain your answer in your book.

2) Romesh says, "A triangle can have two obtuse angles."  
Is he correct? \_\_\_\_\_  
Prove it in your book.

Hot task - This will replace your long yellow comments for most children

After hot task, Green comment - short phrase or encouraging word.

If children have got questions incorrect on hot task.

Please write a yellow comment

e.g. Please check your answers and remember to multiply the numerators together and then denominators.



# Maths planning

- **Planning:**
- Use the Collins planning to form the skeleton structure of the lesson.
- Plan using the PW way.
- Addressing misconceptions as they occur.
- Go over things again and recap when needed.
- Make explicit links to Oracy and Maths reasoning
- Use White Rose/My maths/etc

## Home Learning

KS 1

Numbots

TTRS

KS2

Numbots

TTRS

My Maths



# What is mastery?

- Deep and sustainable learning
- Ability to build on something already mastered
- Ability to reason about a concept and make connections to other concepts
- Procedural fluency with conceptual understanding -the understanding of how and why it all works
- Mastery is a continuum... mastery at a particular point of time that is sufficient mastery for that stage of learning and then built on at a later stage

Why do we need a mastery approach?



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# WODB - making connections Including opportunities for Oracy

Which one doesn't belong?

- Asking questions
- Different representations
- Use of concrete materials to make the connections

A

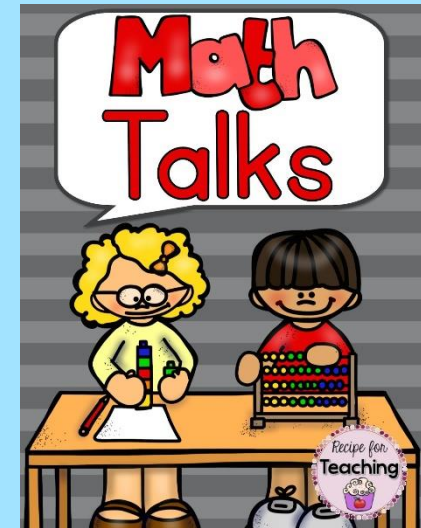
B

Which one DOESN'T belong?

C

D

156			
50	50	50	16



# WODB - making connections

## Including opportunities for Oracy

Which one doesn't belong?

A whiteboard with four math problems labeled A, B, C, and D. Each problem consists of a different colored bead array and a sticky note with a question.

- A:** Four blue bead arrays, each with 6 beads (2 rows of 3). A red sticky note with the letter 'A' is below it.
- B:** A green sticky note with the text " $\frac{1}{2}$  of 48". A red sticky note with the letter 'B' is below it.
- C:** A pink sticky note with the text "Double 12". A red sticky note with the letter 'C' is below it.
- D:** Five green bead arrays, each with 6 beads (2 rows of 3). A red sticky note with the letter 'D' is below it.

In the center of the whiteboard is an orange sticky note with the text "Which one DOESN'T belong?"



# WODB - making connections Including opportunities for Oracy

Which one doesn't belong?

The image shows a collection of four items labeled A, B, C, and D, arranged on a white background. Item A consists of four playing cards: the 10 of Clubs, the 10 of Diamonds, the Jack of Hearts, and the 10 of Spades. Item B consists of four pink circular markers, each with the number '10' written on it. Item C is a pink rectangular sticky note with the number '48' written on it. Item D consists of three blue blister packs, each containing 12 white pills, and a single grey blister pack containing two white pills. A yellow sticky note with the handwritten text 'Which one DOESN'T belong?' is placed in the center of the collection. The labels A, B, C, and D are small red squares placed below their respective items.

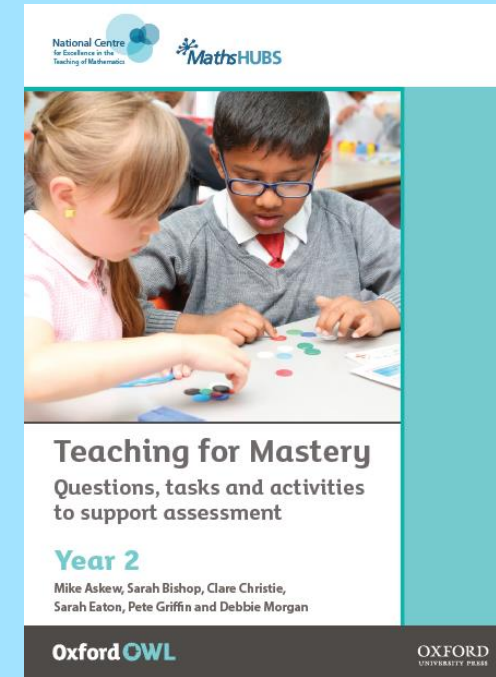
# A pupil really understands a concept if they can....

## Maths mastery

A useful checklist for what to look out for when assessing a pupil's understanding might be:

A pupil really understands a mathematical concept, idea or technique if he or she can:

- describe it in his or her own words;
- represent it in a variety of ways (e.g. using concrete materials, pictures and symbols – the CPA approach)<sup>8</sup>
- explain it to someone else;
- make up his or her own examples (and non-examples) of it;
- see connections between it and other facts or ideas;
- recognise it in new situations and contexts;
- make use of it in various ways, including in new situations.<sup>9</sup>



## Maths mastery at greater depth

Developing mastery with greater depth is characterised by pupils' ability to:

- solve problems of greater complexity (i.e. where the approach is not immediately obvious), demonstrating creativity and imagination;
- independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics.



## Teaching for depth of understanding Multiple Representations

- Concrete Pictorial Abstract is a key part of the maths mastery approach.
- In a nutshell, the CPA approach uses concrete manipulatives to eventually gain a secure understanding of more abstract mathematical concepts.

- **Stage 1:** Concrete and action-based representation using manipulatives like money, counters, cubes, base ten blocks and dice to explore and solve problems — think of it as the 'doing' stage.
- **Stage 2:** Pictorial representations of concrete objects such as bar models are used to model problems — the 'seeing' stage.
- **Stage 3:** Abstract notations using mathematical symbols — the symbolic stage.

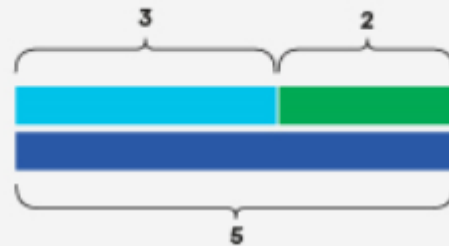


# Teaching for depth of understanding Multiple Representations

- At each stage of the CPA journey, learners build on their knowledge and deepen their understanding.
- The concrete stage helps to bring concepts to life. As they move to the pictorial stage, the concrete stage helps learners make connections between the objects they just handled and pictorial representations. The final abstract stage stands on the shoulders of the concrete and pictorial exploration.



Concrete



Pictorial

$$3 + 2 = 5$$

Abstract

# Showing the link between pictorial and abstract

10/5/2021

LO: To add fractions with the same denominator

Colour in the fraction bars to show these calculations and then give the answers.

1.  $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$



7

2.  $\frac{2}{10} + \frac{4}{10} + \frac{3}{10} = \frac{9}{10}$



10


10)  $\frac{4}{9} + \frac{8}{9} = \underline{\quad}$







Children used bars to help answer questions related to adding fractions.

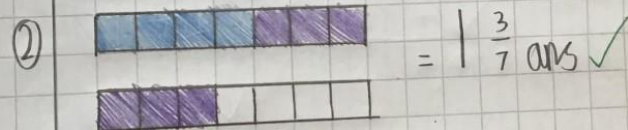
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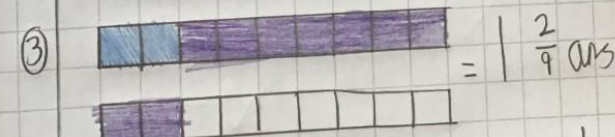
1)  =  $\frac{4}{9} + \frac{3}{9}$


2)  =  $\frac{4}{8}$

challenge 1

①  =  $\frac{4}{10}$  ans ✓

②  =  $\frac{3}{7}$  ans ✓

③  =  $\frac{2}{9}$  ans

④  =  $\frac{2}{5}$

⑤

# CPA - @Pinner Wood

- This is something we are working on currently.

## Move flexibly between CPA stages

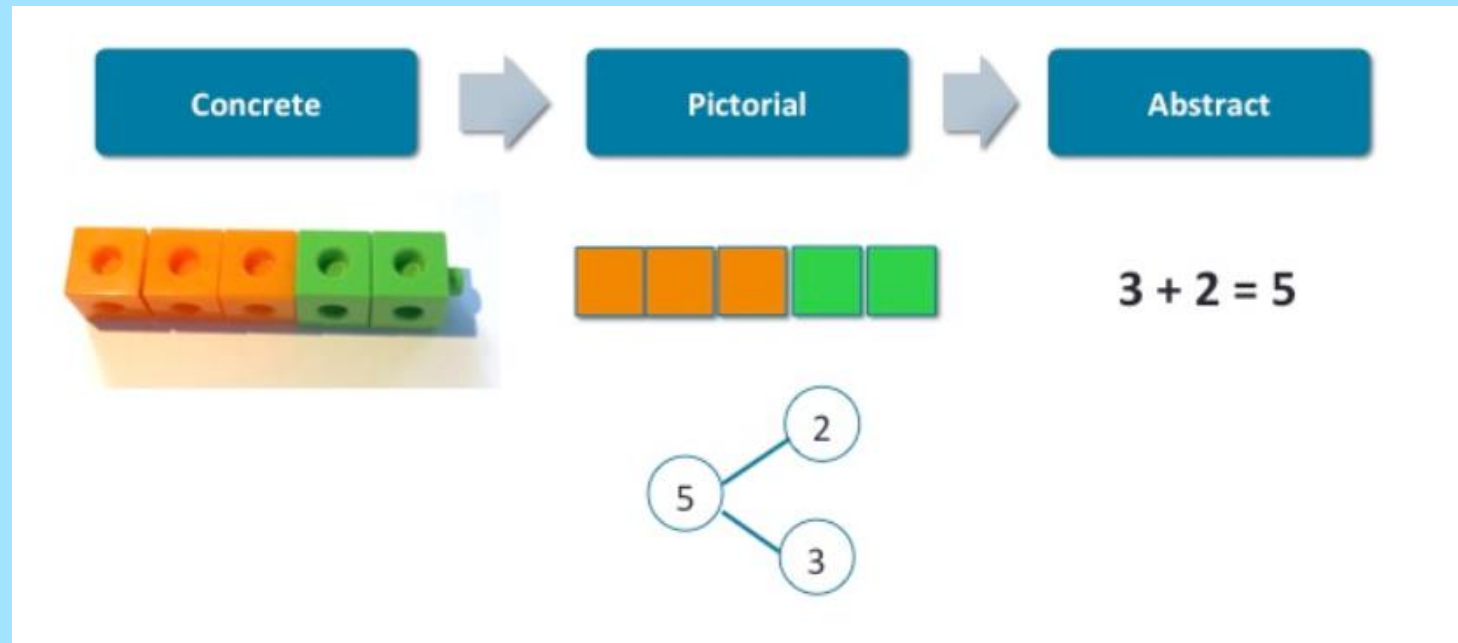
- CPA is usually linear but you can move back to the concrete or pictorial representation stage when introducing new concepts, adding a challenge, or if students are not feeling secure about a topic.
- Instead of rushing to give up manipulatives, make them available for all children to use.
- Encourage your class to see these resources as useful for everyone, rather than just for children at risk of being left behind or those with special educational needs.



# CPA model



<https://mathsnoproblem.com/en/approach/concrete-pictorial-abstract/>



# Resources

White Rose:

## Premium Resources

Videos and front of class teaching slides will be released in line with our [lesson by lesson overviews](#). We will try to release content as soon as possible but cannot guarantee it will be available earlier than the dates on the lesson by lesson overviews. As soon as new content is finalised it will be uploaded to the site.

Infant	Primary	Secondary
<a href="#">Year 1</a>	<a href="#">Year 1</a>	<a href="#">Year 5</a>
<a href="#">Year 2</a>	<a href="#">Year 2</a>	<a href="#">Year 6</a>
	<a href="#">Year 3</a>	<a href="#">Year 7</a>
	<a href="#">Year 4</a>	<a href="#">Year 8</a>
	<a href="#">Year 5</a>	<a href="#">Year 9</a>

<https://resources.whiterosemaths.com/resources/>





# Resources

White Rose:

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition and Subtraction			Measurement: Length and Perimeter		Number: Multiplication and Division			
Spring	Number: Multiplication and Division		Measurement: Area	Number: Fractions				Number: Decimals		Consolidation		
Summer	Number: Decimals	Measurement: Money		Measurement: Time		Statistics	Geometry: Properties of Shape		Geometry: Position and Direction		Consolidation	

## Autumn Activities

Get resources for Autumn Activity Week

## Spring Activities

Get the resources for Spring Activity Week

## Summer Activities

Resources for Summer Activity Week will be released in the Summer term



<https://resources.whiterosemaths.com/resources/>



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# Maths Passports

## My Maths

### Timestable rockstars



Maths Passports done weekly

