Maths - One Voice

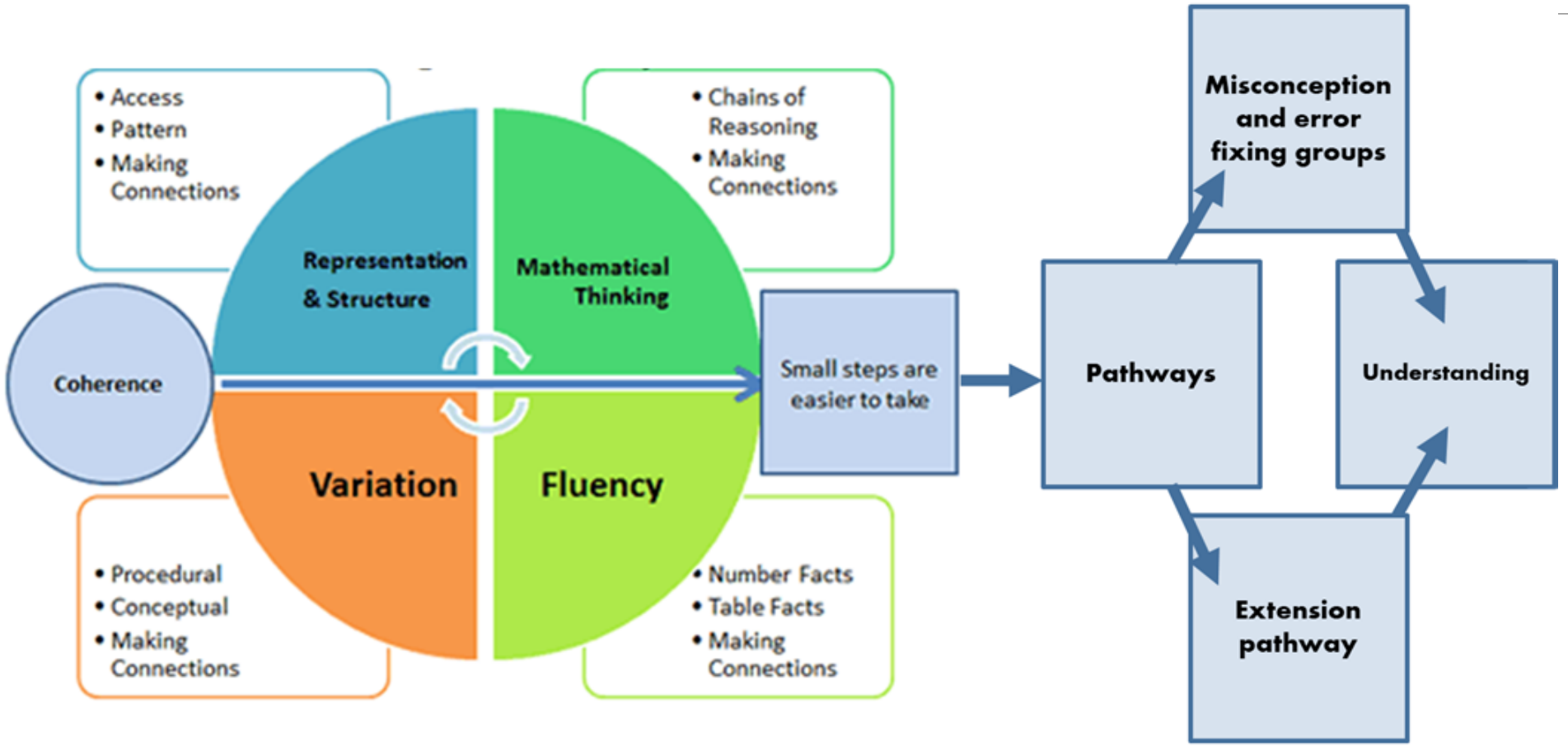
How is learning across school sequenced?

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

How is learning across school sequenced?

Maths Learning Cycle



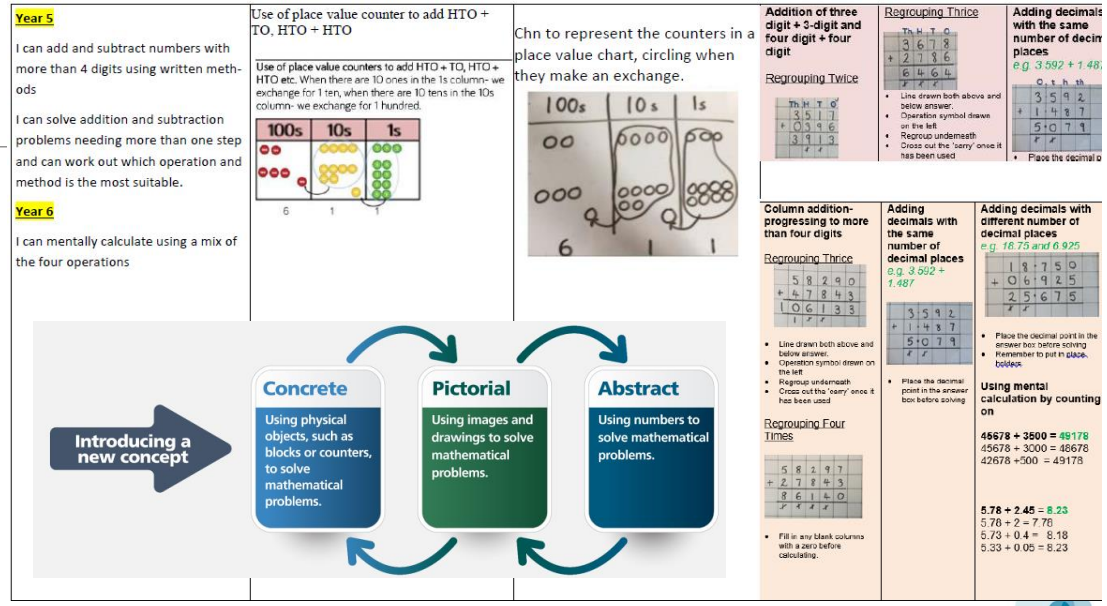
NC objectives are taught within each year group and worked within our learning cycle for each unit of work.

How is learning across school sequenced?

Progression of Skills Documents

Maths Overview of Skills and Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Topics covered	**Autumn** Place Value Addition and Subtraction Shape Place Value consolidation **Spring** Addition and subtraction Place value Length and height Weight and volume **Summer** Multiplication and division Fractions Position and direction Place value Money Time	**Autumn** Place Value Addition and subtraction Shape **Spring** Money Multiplication and division Length and height Mass, capacity and temperature **Summer** Fractions Time Statistics Position and Direction	**Autumn** Place Value Addition and subtraction Multiplication and division **Spring** Multiplication and division Length and perimeter Fractions Mass and capacity **Summer** Fractions Money Time Shape Statistics	**Autumn** Place Value Addition and subtraction Area Multiplication and division **Spring** Multiplication and division Length and perimeter Fractions Decimals **Summer** Decimals Money Time Shape Statistics Position and direction	**Autumn** Place Value Addition and Subtraction Multiplication and division Fractions **Spring** Multiplication and division Fractions Decimals and percentages Area and perimeter Statistics **Summer** Shape Position and direction Decimals Negative numbers Converting units Volume	**Autumn** Place Value Four Operations Fractions Converting units **Spring** Ratio Algebra Decimals Fractions, decimals and percentages Perimeter, area and volume Statistics **Summer** Shape Position and direction Problem solving Consolodation
Number and place Value	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Count, read and write numbers to 100 in numerals and words. Given a number, identify one more or one less. Identify and represent numbers using objects and pictorial representations. Use the language of: equal to, more than, less than, most and least. Count in steps of 2, 5 and 10 from 0.	Read and write numbers to 100 in numerals and words. Recognise the place value of each digit in a two-digit number Identify, represent and estimate numbers using different representations. Compare and order numbers to 100 using < > and = Use place value and number facts to solve problems. Count in steps of 2, 3 and 5 from 0 and in 10s from any number backwards and forwards.	Identify, represent and estimate numbers using different representations. Find 10 or 100 more or less than a given number. Recognise the place value of each digit in a three-digit number. Compare and order numbers up to 1000. Read and write numbers up to 1000 in numerals and in words. Solve number problems and practical problems involving these ideas.	Count in multiples of 6, 7, 9, 25 and 1000. Find 1000 more or less than a given number. Recognise the place value of each digit in a four-digit number. Order and compare numbers beyond 1000. Identify, represent and estimate numbers using different representations. Round any number to the nearest 10, 100 and 1000. Solve number and practical problems. Count back through	Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit. Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000. Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through 0. Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10000 and 100000.	Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit. Round any whole number to a required degree of accuracy. Use negative numbers in context and calculate intervals across 0. Solve number and practical problems.



Number: Addition and Subtraction with Reasoning

National Centre for Excellence in the Teaching of Mathematics

MENTAL CALCULATION					
add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
Working backwards Through practical games on number tracks and lines ask questions such as "where have you landed?" and "what numbers would you need to throw to land on other given numbers?" **What do you notice?** 11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers?	**True or false?** Are these number sentences true or false?73 + 40 = 113 98 – 18 = 70 46 + 77 = 123 92 – 67 = 35 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 = Explain why you think the hard questions are hard?	**True or false?** Are these number sentences true or false?597 + 7 = 614 804 – 70 = 744 768 + 140 = 908 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 323 + 10 = 393 + 10 = 454 - 100 = 954 - 120 = Explain why you think the hard questions are hard?	**True or false?** Are these number sentences true or false?6.7 + 0.4 = 6.11 8.1 – 0.9 = 7.2 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 13323 - 70 = 12893 + 300 = 19354 - 500 = 19954 + 100 = Explain why you think the hard questions are hard?	**True or false?** Are these number sentences true or false?6.17 + 0.4 = 6.57 8.12 – 0.9 = 8.3 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 213323 - 70 = 512893 + 300 = 819354 - 500 = 319954 + 100 = Explain why you think the hard questions are hard?	**True or false?** Are these number sentences true or false?6.32 + □ = 8 □ = 1.68 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 213323 - 70 = 512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard?

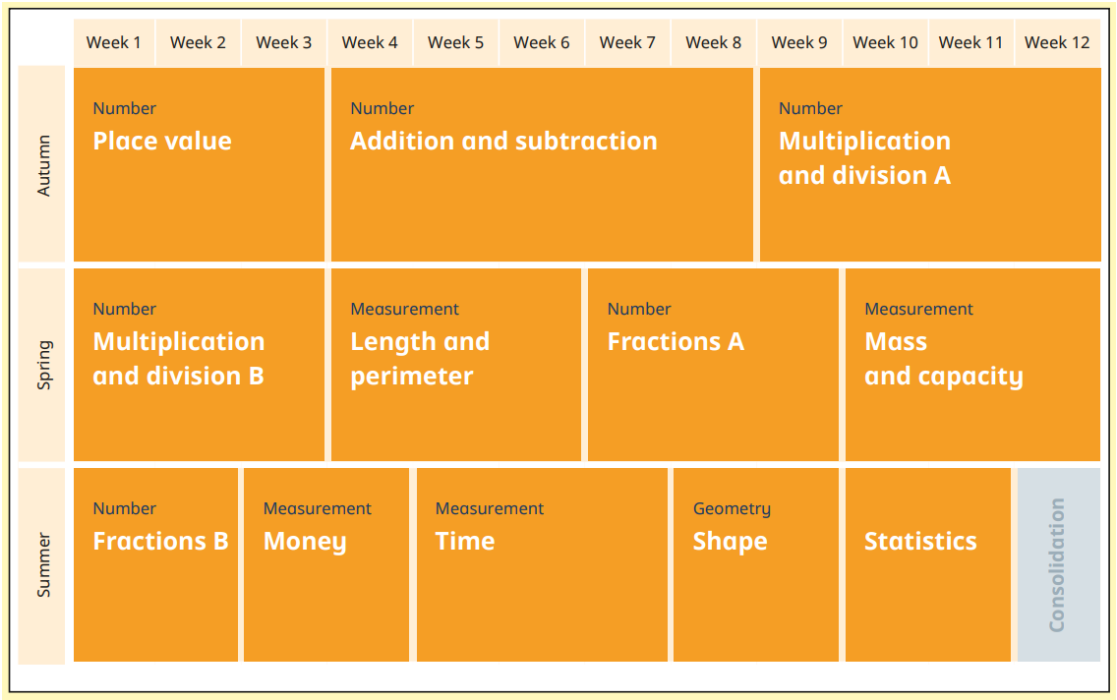
Progression of skills documents from the NCETM, CCJS Math and Calculation Policies are used to guide staff to know prior learning of the children and the next steps. This informs teachers planning accordingly.

How is learning across school sequenced?

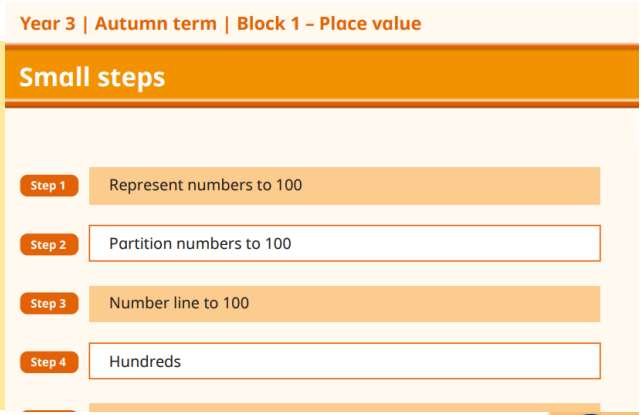
Long-term plans are constructed and built upon by each year group team.

These include:

- key objectives taught from the National Curriculum
- White Rose Maths LTPs and MTPs used by all staff from Years 3 to Year 6.
- NCETM Resources used throughout school.



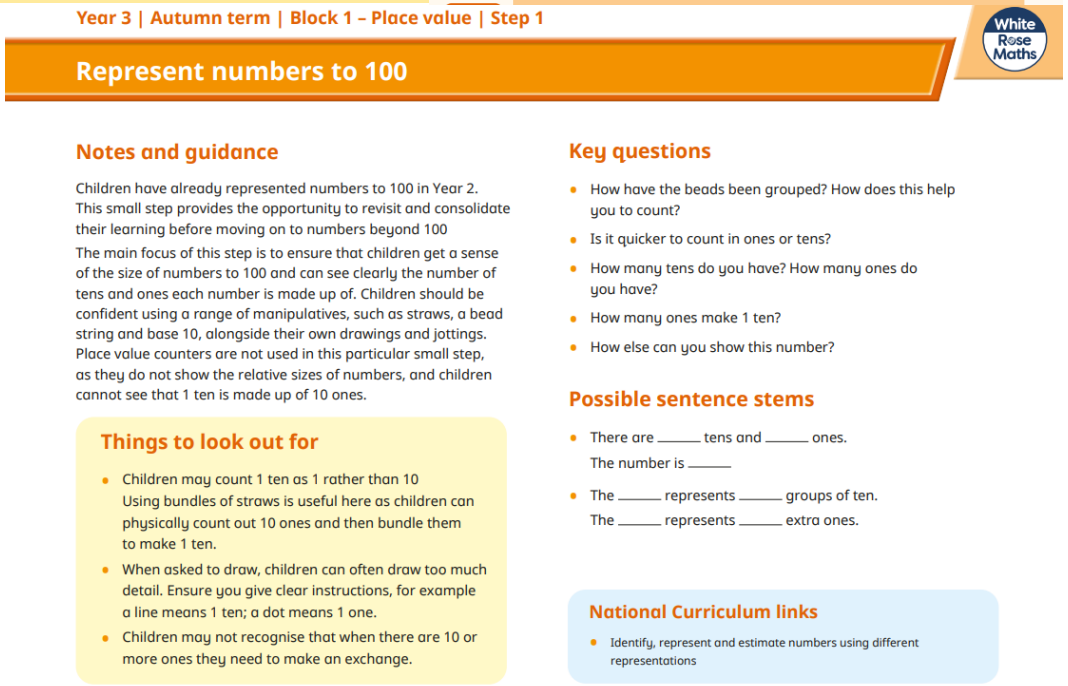
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**			Number **Addition and subtraction**					Number **Multiplication and division A**			
Spring	Number **Multiplication and division B**			Measurement **Length and perimeter**			Number **Fractions A**			Measurement **Mass and capacity**		
Summer	Number **Fractions B**		Measurement **Money**		Measurement **Time**			Geometry **Shape**		**Statistics**		Consolidation



Year 3 | Autumn term | Block 1 – Place value

Small steps

Step 1	Represent numbers to 100
Step 2	Partition numbers to 100
Step 3	Number line to 100
Step 4	Hundreds



Year 3 | Autumn term | Block 1 – Place value | Step 1

Represent numbers to 100

White Rose Maths

Notes and guidance

Children have already represented numbers to 100 in Year 2. This small step provides the opportunity to revisit and consolidate their learning before moving on to numbers beyond 100

The main focus of this step is to ensure that children get a sense of the size of numbers to 100 and can see clearly the number of tens and ones each number is made up of. Children should be confident using a range of manipulatives, such as straws, a bead string and base 10, alongside their own drawings and jottings. Place value counters are not used in this particular small step, as they do not show the relative sizes of numbers, and children cannot see that 1 ten is made up of 10 ones.

Things to look out for

- Children may count 1 ten as 1 rather than 10
  Using bundles of straws is useful here as children can physically count out 10 ones and then bundle them to make 1 ten.
- When asked to draw, children can often draw too much detail. Ensure you give clear instructions, for example a line means 1 ten; a dot means 1 one.
- Children may not recognise that when there are 10 or more ones they need to make an exchange.

Key questions

- How have the beads been grouped? How does this help you to count?
- Is it quicker to count in ones or tens?
- How many tens do you have? How many ones do you have?
- How many ones make 1 ten?
- How else can you show this number?

Possible sentence stems

- There are _____ tens and _____ ones.
  The number is _____
- The _____ represents _____ groups of ten.
  The _____ represents _____ extra ones.

National Curriculum links

- Identify, represent and estimate numbers using different representations

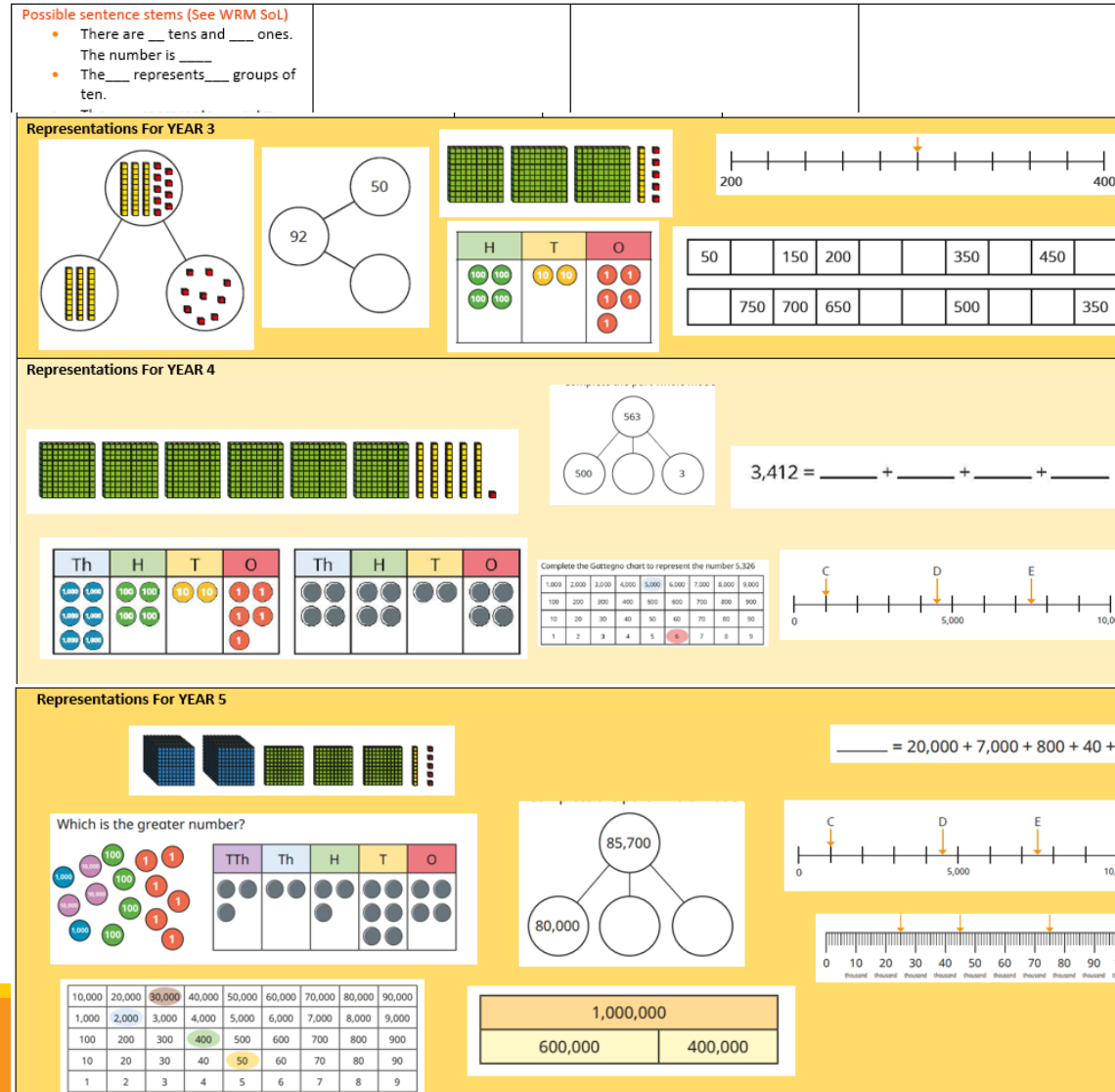
How is learning across school sequenced?

Example of Medium Term Plans informed by Maths Policy, WR LTP & MTPs, RTP and NCETM documents

YEAR 3 Medium Term Planning — Cheadle Catholic Junior School

Prior Learning:	Autumn Block 1: Place Value	Future Learning:
• read and write numbers to at least 100 in numerals and in words • identify, represent and estimate numbers using different representations, including the number line • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward • recognise the place value of each digit in a two-digit number (tens, ones) • compare and order numbers from 0 up to 100; use <, > and = signs	National Curriculum 2014 • Identify, represent and estimate numbers using different representations • Read and write numbers up to 1000 in numerals and in words • Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones) • Count from zero in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • Compare and order numbers up to 1000	• count in multiples of 6, 7, 9, 25 and 1000 • count backwards through zero to include negative numbers • identify, represent and estimate numbers using different representations • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value • find 1000 more or less than a given number • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000

Vocabulary		White Rose Maths Small Steps:	Ready to progress	Further Support Material
Refer to Maths Policy to see previously taught vocabulary.		1. Represent numbers to 100 2. Partition numbers to 100 3. Number line to 100 4. Hundreds 5. Represent numbers to 1,000 6. Partition numbers to 1,000 7. Flexible partitioning of numbers to 1,000 8. Hundreds, tens and ones 9. Find 1, 10 or 100 more or less 10. Number line to 1,000 11. Estimate on a number line to 1,000 12. Compare numbers to 1,000 13. Order numbers to 1,000 14. Count in 50s	Year 3 Criteria 3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10 3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and nonstandard partitioning. 3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10 3NPV-4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.	White Rose Maths Autumn Scheme of Learning: Place Value NCETM Spine: 1.17 (TP1 hundreds, 1000, 50s, 25s) 1.18 (TP1 100s,10s,1s) (TP2 number line to 1000) (TP3 1,10,100 more or less) (TP4 compare order) NCETM Ready-to-Progress Powerpoints NRICH activities Classroom Secrets iSeeMaths- Reasoning (See Teacher Server)
Different representations *Place value* *Hundreds, tens and ones* *Even/odd* *Different ways* *Numerals/ digits/ words* *All possibilities* *Solutions/ Method* *Calculations* *Estimate* *Value* *Closest/ furthest* *Halfway* *More than/less than* *Subtract/ add*	*Same/ different/ similarity/ difference* *Symbol* *Greatest/ smallest* *Compare* *Column/ Row* *Most/least* *Ascending/ descending order* *Pattern* *Increase/ decrease* *Sequence* *Ordering* *Relationship* *Multiples/Product/ Factors* *Venn diagram*			

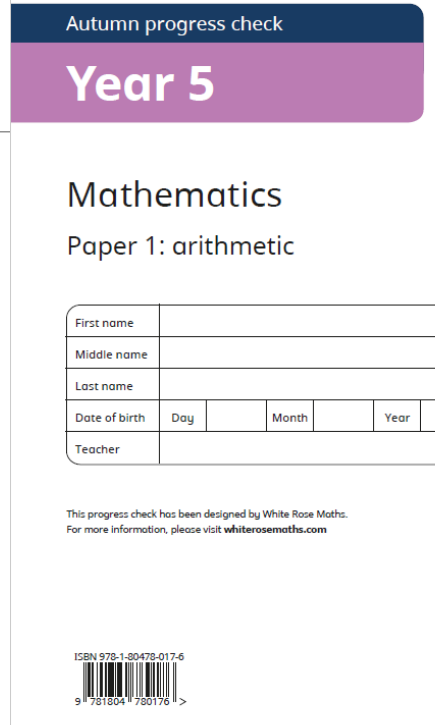


Measuring and Tracking Progress

To support ongoing formative assessment, teachers review pupils' contributions in lessons, work in their books and attainment in end of unit assessments (provided by White Rose). Within lessons, books are marked alongside children where possible to provide in the moment support, next steps and feedback.

These are supported by end of term assessments and end of year tests (White Rose Assessment Year 3, 4 and 5 and SATs Year 6).

Progress and attainment are recorded on tracking sheets on SIMs and are the basis of discussions with Pupil Progress meetings to monitor and track a child's progress related to ARE.


Autumn progress check

Year 5

Mathematics

Paper 1: arithmetic

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
Teacher						

This progress check has been designed by White Rose Maths.
For more information, please visit **whiterosemaths.com**

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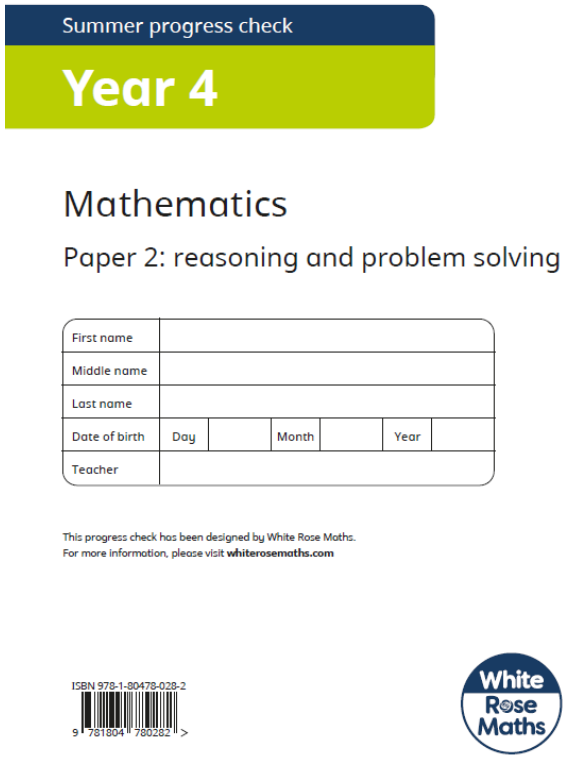
Summer progress check

Year 4

Mathematics

Paper 2: reasoning and problem solving

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
Teacher						

This progress check has been designed by White Rose Maths.
For more information, please visit **whiterosemaths.com**

ISBN 978-1-80478-028-2

White Rose Maths

Priority 1: Standards and Progression Implement and Embed NCETM Mastering Number in Years 4 and 5

Secure firm foundations in multiplicative relationships

Aims of the Programme

Knowledge of multiplication and division and its applications forms the single most important aspect of the KS2 curriculum, and is the gateway to success at secondary school. This project enables pupils in Years 4 and 5 to develop fluency in multiplication and division facts, and a confidence and flexibility with number that exemplifies good number sense.

How will we achieve the programme's aims?:

Training delivered by the NCETM will be attended by Year 4 and 5 group leads, with other teachers attending where possible, in order to deliver five short sessions a week to the Y4 and Y5 cohorts. Further termly training will be held to ensure the objectives are covered according to the guidance. SL will be in regular discussion with Year 4 & 5 teachers to check progress and relevance of the programme and seen evidence of the children's learning.

There is a pre and post programme task for the children to complete that will aid the evaluation of its impact within our school.

Priority 2: Teaching and Learning. Improving competence of pupils in maths through adaptive planning- making effective decisions.

'Its all about how the learning builds in ways that makes sense to children.' Dr Debbie Morgan

Our Aims:

Through ensuring we teach in a coherent way, we scaffold the learning to enable **all pupils** to understand and connect ideas together.

How we will achieve our aims:

- SL to attain and share training delivered by the Maths Hub on 'Adaptive Planning'.
- SL to review termly the impact of recap, retention and consolidation strategies in Maths.
- SL to review classroom resources for Maths
- SL to build upon subject expertise amongst staff and share effective practice and resources.
- SL to review termly our school's Math's Adaptive Teaching Pyramid

Research and analysis

Coordinating mathematical success: the mathematics subject report

Published 13 July 2023

Primary schools should make sure that:

- they identify and sequence small steps in the Reception Year curriculum
- all pupils learn to apply facts and methods to wider problem-solving
- geometry knowledge is sequenced throughout, rather than at the end of, each year's curriculum

Measuring and Tracking Progress Data

Priority 3: Data Evidence Focus Developing approaches to problem solving.

Our Aims:

Mathematical thinking is central to how pupils learn mathematics and includes looking for patterns and relationships, making connections, conjecturing, reasoning, and generalising. Pupils should actively engage in mathematical thinking in all lessons, communicating their ideas using precise mathematical language.

How we will achieve our aims:

- SL to attend 3 TRGs delivered by the maths hub on developing approaches to problem solving and share good practice with staff.
- SL to attend 3 Maths Subject Leader training sessions led by Gareth Metcalfe, sharing good practice with staff.
- Ensure stem sentences continues to be embedded in classroom practice.
- SL to review the use of Maths Working Walls in class.

Research and analysis

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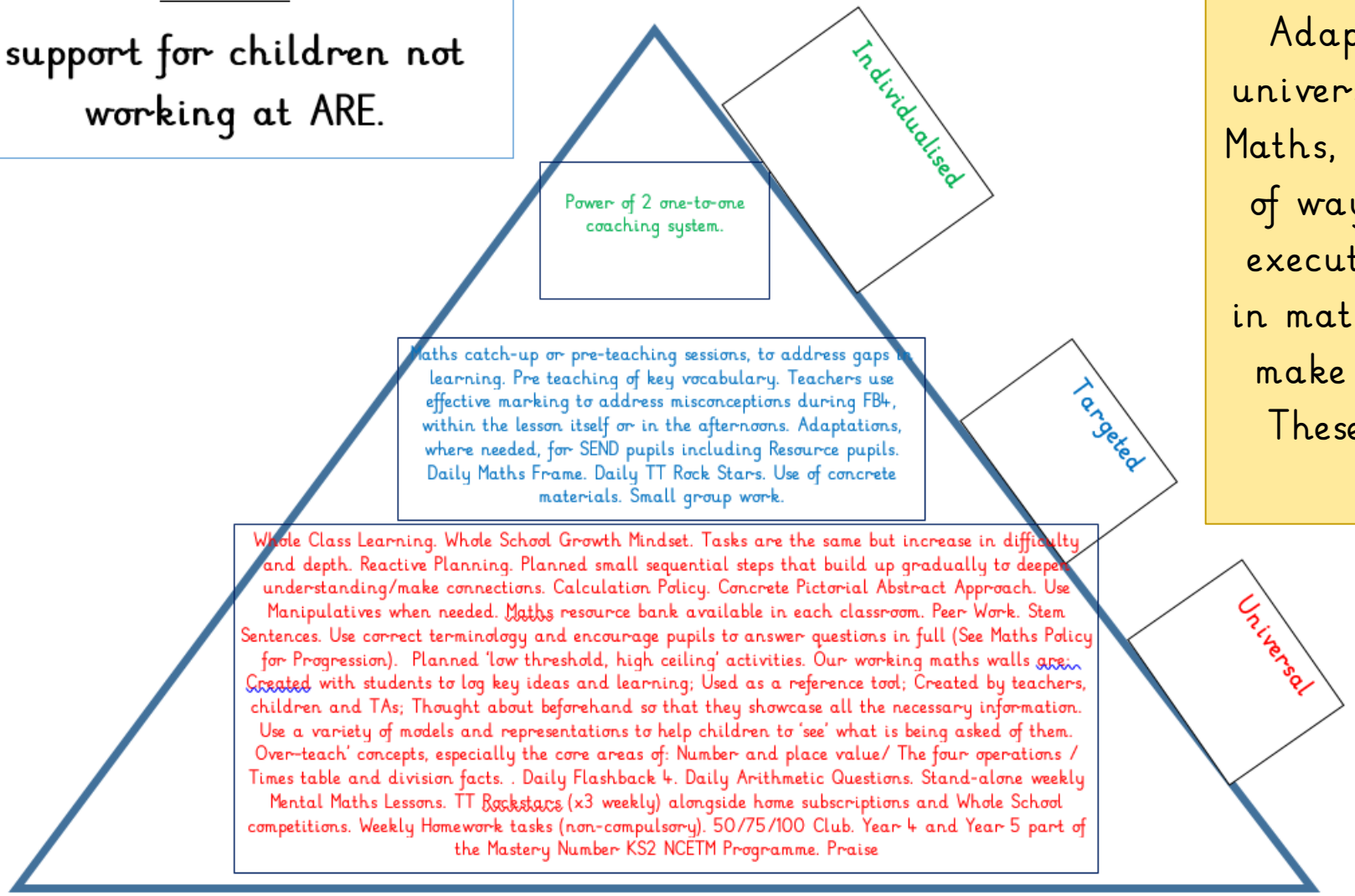
- they identify and sequence small steps in the Reception Year curriculum
- all pupils learn to apply facts and methods to wider problem-solving
- geometry knowledge is sequenced throughout, rather than at the end of, each year's curriculum

Inclusion Adaptive Teaching

Maths:

support for children not working at ARE.



Adaptive teaching is broken down into universal, targeted and individualised. In Maths, children are supported in a number of ways in order to help them learn and execute skills needed to become successful in mathematics, as well as being guided to make connections and identity patterns. These ideas are informed by the NASEN Teacher Handbook.

- Informed by NASEN Handbook - detailed on pages 59- 63.

Pedagogy: Teaching and Learning Strategy

Our Teaching and Learning Strategy outlines the 7 lenses of our approach to pedagogy. These lenses are present in Maths lessons, and are embedded in our Maths lessons. These can be found on page 2 of our policy and are **sequencing, modelling, scaffolding, questioning, practice/review/retrieve, DEAL strategies** and **vocabulary.**

Sequencing	Subject matter is broken into units (White Rose Maths) with predetermined objectives and specified outcomes. Same day marking is used to identify any gaps in learning. Any pupils who do not achieve ARE are provided with extra support through a range of teaching strategies such as more intensive teaching, peer-assisted learning, small group discussions, or additional homework. Teachers' planning is reactive.
Modelling	Lessons are planned to include various mathematical structures - graphs, equations, diagrams, bar models, part whole models, and so forth - to represent real world situations. These models allow pupils to draw and visualize mathematical concepts to make connections, find patterns and solve problems.
Scaffolding	Our school uses the Adaptive Teaching model for all subjects. Our Provision Map for our universal, targeted and individualised approach to Maths can be found on pages 59-63.
Questioning	We encourage peer discussions as we acknowledge: purposeful discussions are vital for creating an enthusiastic mastery classroom (Kagan Structures) Peer discussions are integral to assessment and learning. More effective learning takes place when the teacher doesn't immediately accept or reject an answer. Higher level questioning can be used to challenge advanced learners. Teachers should be brave and not afraid to learn with the class. Use of teacher questioning. How do you know? Can you prove it? Can you come up with a different method? What do you notice? Will it always do that, and why? What happens if? Does your answer seem reasonable? Why/why not?
Practice, review and retrieval	We 'over-teach' concepts, especially the core areas of: Number and place value/ The four operations / Times table and division facts. Daily FB4 and arithmetic helps embed and link knowledge together.
Vocabulary	Our Maths Policy identifies progression of Vocabulary at CCJS. Key vocabulary is displayed on Maths Working Walls alongside key learning STEM sentences.

Development and Systems For Renewal

Book Study	Book Flicks	Pupil Voice
Each term or half term, subject leaders complete a Book Study, informed by the Bedford Study. Teachers and a member of SLT choose an area upon which to focus. Subject leads then create a line of questioning and meet with a small group of children from each year group to evaluate that area of the curriculum. Most recently in Maths, myself and SLT delved into oracy within the classroom.	Every Friday morning, teachers meet for a 'Book Flick', bringing a pre-decided selection of books, (for example all teachers bring books 4-8 in the register). Each week will be lead by a different subject lead and books from the correlating subject will be brought. This is a great opportunity to monitor progression, magpie ideas and assess the effectiveness of teaching and learning.	Pupil's thoughts and ideas are regularly discussed. After Book Flicks, teachers often ask for pupils to meet and discuss their work. Here, we are able to gauge children's ability to explain and recall their learning. Pupil voice activities are often undertaken in a variety of ways, for example after assemblies, book flicks, during lessons and recorded in maths books.

Development: Pupil Voice - What do you think about Maths at our school?

Year 3: I love everything in Maths. My teacher is really helpful and you can use base ten if you need help.

Amber, 3M

I love Flashback 4. They are hard yet fun!

Nell, 3M

Year 4: I think Flashback 4s are really useful. They repeat things we have learnt in our last lesson as well as asking questions about other maths topics. I enjoy the challenge questions in maths and spotting Tiny's mistakes!

Moosa, 4M

Year 5: In Maths I really enjoy doing the harder problem solving and reasoning questions near the end. In school I enjoy Maths because I enjoy the different things we do in it.

Charlotte, 5R

Year 6: I like how maths at our school is very interactive and how the different resources help us to understand. We are really encouraged to know our times tables through TT Rockstars and wherever there is a competition, we're in it!

Charlie, 5LM

Extra Curricular

Cheadle Catholic Junior Sc... · 05/07/2024
Thank you to the Maths department of @StJamesCheadle who led our Year 5 children in a fantastic capacity investigation today. Great maths fun had by all! #maths

Cheadle Catholic Junior School @CheadleRCJnr · Oct 11, 2021
Thank you to the Maths dept of @StJamesCheadle and Y11 pupils for leading some fabulous Maths investigations today.

Cheadle Catholic Junior School @CheadleRCJnr · Nov 17, 2023
The scores are in ... out of over 4000 primary schools, CCJS finished @TTRockStars England Rocks competition in 9th place for total correct answers. Our amazing children correctly answered 477,543 questions in just 3 hours!
What an amazing team achievement! #MathsWeekEngland

Cheadle Catholic Junior Sc... · 23/04/2024
Year 4 have been busy all around the school site today using @StockportSHAPES orienteering materials. Great to get some extra grammar and maths work in too!

Cheadle Catholic Junior Sc... · 22/07/2024
In Design technology our Year 3 children have been exploring tetrahedron.
Today they took on the challenge of joining dowling rods to build giant Tetrahedron. Great work Year 3!

Cheadle Catholic Junior Sc... · 03/07/2024
Well done to a group of Year 5 boys who attended a Maths Challenge today at @StAmbroseColl with schools across South Manchester
They showed great reasoning and determination. Thank you St Ambrose for inviting us.