

TEACHING & LEARNING JOURNAL - EDITION 43

Maths Curriculum

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In my TNG meeting it was apparent that Mildenhall Academy and The Nicholas Hammond Academy both used White Rose as part of their Key Stage 3 curriculum. So I looked into White Rose to see if this could improve our curriculum at Key Stage 3.

White Rose Curriculum

The **White Rose Maths** SOLs are designed to give sufficient time for teachers to explore and understand concepts in depth, rather than covering it superficially and then returning several times. However, we appreciate that schools will rightly want to enable children to revisit concepts and ensure number fluency.

	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	Algebraic Thinking						Place Value and Proportion					
	Sequences	Understand and use algebraic notation		Equality and equivalence		Place value and ordering integers and decimals			Fraction, decimal and percentage equivalence			
Spring	Applications of Number						Directed Number			Fractional Thinking		
	Solving problems with addition & subtraction	Solving problems with multiplication and division			Fractions & percentages of amounts		Operations and equations with directed number			Addition and subtraction of fractions		
Summer	Lines and Angles						Reasoning with Number					
	Constructing, measuring and using geometric notation		Developing geometric reasoning			Developing number sense		Sets and probability		Prime numbers and proof		

The Scheme of Work is for all students' looks at deeper understanding. Helping students on their journey towards mastery is exactly what White Rose Maths exists to do. So they spend more time on topics to try and give students' complete understanding of the topic.

I then looked at the first half of the autumn term to see what was covered in this extended time period. The Scheme of Work covers sequences, Algebraic notation, Algebraic expressions and solving equations. (As Shown below)

Autumn 1: Algebraic thinking	
Week 1: Exploring Sequences Rather than rushing to find rules for n^{th} term, this week is spent exploring sequences in detail, using both diagrams and lists of numbers. Technology is used to produce graphs so students can appreciate and use the words "linear" and "non-linear" linking to the patterns they have spotted. Calculators are used throughout so number skills are not a barrier to finding the changes between terms or subsequent terms. Sequences are treated more formally later this unit. National curriculum content covered: <ul style="list-style-type: none"> move freely between different numerical, algebraic, graphical and diagrammatic representations make and test conjectures about patterns and relationships use a calculator and other technologies to calculate results accurately and then interpret them appropriately generate terms of a sequence from a term-to-term rule recognise arithmetic sequences recognise geometric sequences and appreciate other sequences that arise 	<ul style="list-style-type: none"> model situations or procedures by translating them into algebraic expressions substitute values in expressions, rearrange and simplify expressions use and interpret algebraic notation, including: <ul style="list-style-type: none"> ab in place of $a \times b$ $3y$ in place of $y + y + y$ and $3 \times y$ a^2 in place of $a \times a$ ab in place of $a \times b$ $\frac{a}{b}$ in place of $a \div b$ generate terms of a sequence from a term-to-term rule produce graphs of linear functions of one variable
Weeks 2 to 4: Understanding and using algebraic notation The focus of these three weeks is developing a deep understanding of the basic algebraic forms, with more complex expressions being dealt with later. Function machines are used alongside bar models and letter notation, with time invested in single function machines and the links to inverse operations before moving on to series of two machines and substitution into short abstract expressions. National curriculum content covered: <ul style="list-style-type: none"> move freely between different numerical, algebraic, graphical and diagrammatic representations use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships recognise and use relationships between operations including inverse operations 	Weeks 5 and 6: Equality and equivalence In this section students are introduced to forming and solving one-step linear equations, building on their study of inverse operations. The equations met will mainly require the use of a calculator, both to develop their skills and to ensure understanding of how to solve equations rather than spotting solutions. This work will be developed when two-step equations are met in the next place value unit and throughout the course. The unit finishes within consideration of equivalence and the difference between this and equality, illustrated through collecting like terms. National curriculum content covered: <ul style="list-style-type: none"> use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships simplify and manipulate algebraic expressions to maintain equivalence by collecting like terms use approximation through rounding to estimate answers use algebraic methods to solve linear equations in one variable



This did not seem a lot of work and would equate to 21 lessons and there is no differentiation in the scheme. So I look at the Sequences lesson plans to see how much was covered in the teaching.

Sequences

Small Steps

- Describe and continue a sequence given diagrammatically
- Predict and check the next term(s) of a sequence
- Represent sequences in tabular and graphical forms
- Recognise the difference between linear and non-linear sequences
- Continue numerical linear sequences
- Continue numerical non-linear sequences
- Explain the term-to-term rule of numerical sequences in words
- Find missing numbers within sequences

H denotes higher strand and not necessarily content for Higher Tier GCSE


White Rose looks at Concrete, Pictorial and Abstract when working through a topic. So, the sequences lessons follow the steps and covers most of the topic, but I would expect top sets to be finding the Nth term of sequences as a minimum requirement. So, I investigated the assessment on sequences.

Year 7

Sequences

Name _____

1

Here are the first three terms in a sequence.

Draw the next term in the sequence.

How many circles will make up the 5th term?

☐
1 mark

2

Find the next two terms in each of the linear sequences.
51, 47, 43, _____, _____
1500, 2600, 3700, _____, _____
7.25, 7.45, 7.65, _____, _____

☐
1 mark

☐
3 marks

This looks very much like the Key Stage 2 assessments and still did not cover the Nth term for the top set students.



So to summaries White Rose gives a lot of time to complete topics but gives teachers little help in preparing for their lessons and only gives a few examples on the Scheme of Work. The course has differentiation but does not extend the higher ability students as much as Edexcel course does. It seems to be an add on to the primary curriculum and the assessments are not getting the students ready for GCSE papers.

From research it seems that teachers in other schools use the White Rose resources to dip into but do not actually follow the scheme of work. Our current Scheme of work does look at the topics in depth but also provides good questions that are used on the GCSE papers. Also, they have differentiated to allow the top sets to improve using the Delta course, the middle ability to follow the Theta course but also allows the lower ability students to work at the level that suits the Using the Pi course. The Active teach program allows teaches to use the interactive resources and those difficult questions in their teaching. So, I will continue to use the Edexcel course and keep up to date with their changes as they seem the better route to enable all our students to make progress in maths.

