

Intent

The Year 7 maths curriculum at The Whitehaven Academy aims to build directly on students' progress from KS2 through a mastery and problem solving approach. Mathematical concepts are explored through small steps developed from the White Rose scheme of learning to allow students to fully understand each element and avoid cognitive overload and repetition of rote methods. Students will be given the opportunity to solve problems every lesson through both independent and group tasks.

There is a large focus on number skills and implementation of numerical methods within a variety of contexts along with an introduction and exploration of algebra and use of geometric reasoning.

By the end of year 7 The Whitehaven Academy maths department aims to ensure all students are able to reason with and perform all four operations with both positive and negative, integer and non-integer numbers, begin to solve problems using algebraic thinking and efficiently use a scientific calculator.

Implementation

Each term is split into different areas of focus with each area being made up of different small steps to be taken in order to gain full understanding. Year 7 areas of focus are as follows:

- Algebraic Thinking
 - Sequences
 - Understanding and using algebraic notation
 - Equality and equivalence
- Place Value and Proportion
 - Place value and ordering integers and decimals
 - Fraction, decimal and percentage equivalence
- Applications of Number
 - Solving problems with addition and subtraction
 - Solving problems with multiplication and division
- Directed Number
 - Four operations with directed number
- Fractional Thinking
 - Addition and subtraction of fractions
- Lines and Angles

Impact

Starting the year with algebraic thinking allows all students to engage with meaningful mathematical investigative processes, use of calculators here ensures that students are not held back by their numerical skills and aims to build their ability to use scientific calculators effectively.

Throughout Year 7 there is a focus on number skills to consolidate and build upon students' knowledge from Key Stage 2. Ensuring that students have a good knowledge base with number reasoning and operations in year 7 will allow them to access the mathematics and general curriculum as they move through their secondary education and onwards.

Working with geometry, sets and probability gives students a chance to apply their number skills in further real and abstract situations. This allows further emphasis on not just gaining knowledge but applying knowledge so that students see the benefit of mastering techniques in order to gain a further

- Constructing, measuring and using geometric notation
- Developing geometric reasoning
- Reasoning with Number
 - Developing number sense
 - Sets and probability
 - Prime numbers and proof

Assessment

- Students are assessed at the end of each teaching unit using White Rose Maths topic assessments.
- Each assessment maps to 9 key learning indicators, KLIs.
- The mappings for the KLIs is shown in the table below.
- Summative year 7 assessments take place in the Summer term for year 7.
- Students' performance towards the KLIs is assessed as above expected, expected or below expected.
- Each assessment is used to inform planning to ensure gaps in learning are closed.
- Reteach time is built into the curriculum to ensure there is the opportunity respond to students needs indicated from the assessments/KLIs.

strategy or skill that could help them with a future problem in school or home life.

Year 7

Key Learning Indicators

SKILLS

CONTENT

Fluency	Reasoning	Problem Solving	Number	Ratio and proportion	Algebra	Geometry and measures	Probability	Statistics
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HT 1	Sequences					✓		
	Understand and use algebraic notation	✓				✓		
	Equality and equivalence			✓		✓		
HT 2	Place value and ordering integers and decimals			✓			✓	
	Fraction, decimal and percentage equivalence	✓		✓			✓	
	End of term assessment	✓	✓	✓		✓	✓	
HT3	Solving problems with addition and subtraction		✓	✓		✓	✓	
	Solving problems with multiplication and division		✓	✓		✓	✓	
	Fractions and percentages of amounts	✓		✓				
HT 4	Operations and equations with directed number			✓		✓		
	Addition and subtraction of fractions	✓		✓				
	End of term assessment	✓	✓	✓		✓	✓	
HT 5	Constructing measuring and using geometric notation					✓	✓	
	Developing geometric reasoning		✓	✓			✓	
HT 6	Developing number sense	✓		✓				
	Sets and probability	✓					✓	
	Prime numbers and proof		✓		✓			
	End of term assessment	✓	✓	✓	✓	✓	✓	

Key Knowledge and Skills Cross Curricular

Opportunities will be taken where appropriate, on a lesson by lesson basis, to make links with other subject areas in school, with financial maths and career opportunities. These are highlighted on lesson PowerPoints.

Intent

The KS3 maths curriculum in year 8 at The Whitehaven Academy aims to build directly on students' progress from year 7 through a mastery and problem solving approach. Mathematical concepts are explored through small steps developed from the White Rose scheme of learning to allow students to fully understand each element and avoid cognitive overload and repetition of rote methods. Students will be given the opportunity to solve problems every lesson through both independent and group tasks.

The aim of year 8 is to build on prior skills through using existing knowledge in different contexts and applications with an increased focus on algebraic techniques including graphing and proportional reasoning. These skills are also embedded through revisiting them in both geometry where π is introduced and reasoning with data.

By the end of year 8 The Whitehaven Academy maths department aims to ensure all students are able to apply their correct numerical thinking to problems involving proportion and are beginning to use algebraic techniques to solve problems in a variety of contexts across the curriculum.

Implementation

Each term is split into different areas of focus with each area being made up of different small steps to be taken in order to gain full understanding. Year 8 areas of focus are as follows:

- Proportional Reasoning
 - Ratio and scale
 - Multiplicative change
 - Multiplying and dividing fractions
- Representation
 - Working in the Cartesian plane
 - Representation of data
 - Tables and probability
- Algebraic Techniques
 - Brackets, equations and inequalities
 - Sequences
 - Indices
- Developing Number
 - Fractions and percentages
 - Standard index form

Impact

In year 8 the number element of the curriculum switches from fluency with number calculations to calculations involving proportion. There is a continued emphasis on working with fractions in a variety of contexts however only two of the overarching units focus specifically on number signifying the shift to number calculations being a tool to unlock reasoning across problems in a variety of contexts as opposed to being an independent element.

Algebra skills are developed in year 8 with the introduction of inequalities and multi-step equations and inequalities are solved involving brackets. Straight line graphs are also introduced during representations to begin to develop the link between the different representations of algebra.

Year 8 is the first time students work with data in KS3, there is a focus on the different types of data along with scatter graphs and two way tables to compare and analyse data. Probability is also built on from year 7 with listing of outcomes.

- Number sense

- Developing Geometry
 - Angles in parallel line and polygons
 - Area of trapezia and circles
 - Line symmetry and reflection
- Reasoning with data
 - The data handling cycle
 - Measures of location

Assessment

- Each lesson provides opportunity for assessment.
- Formal assessment takes place at the end of each block.
- Summative assessments take place in the autumn term and assessment week in the Summer term for year 8.
- Each type of assessment aims to inform planning and delivery and is based on guidance from White Rose Maths and the NNW maths hub work on mastery in mathematics.

Reasoning with angles develops in year 8 to involve parallel lines and interior and exterior angles of polygons and moves on to involve proof of geometric facts. The area of trapezia, circles and compound shapes are also introduced and work alongside the ongoing ability to vary between non calculator and effective calculator methods.

Key Knowledge and Skills Cross Curricular

Opportunities will be taken where appropriate, on a lesson by lesson basis, to make links with other subject areas in school, with financial maths and career opportunities. These are highlighted on lesson PowerPoints.

Intent

The KS3 maths curriculum in year 9 at Whitehaven Academy aims to build directly on students' progress from year 8 through a mastery and problem-solving approach. Mathematical concepts are explored through small steps developed from the White Rose scheme of learning to allow students to fully understand each element and avoid cognitive overload and repetition of rote methods. Students will be given the opportunity to solve problems every lesson through both independent and group tasks.

The aim of year 9 is not only embed all prior skills but also to link them together to enable students to access and reason with complex mathematical problems especially those involving geometrical concepts new to the students.

By the end of year 9, in addition to the learning accomplished in years 7 and 8, Whitehaven Academy maths department aims to ensure students are able to independently reason with number, including proportion, and algebra along with knowledge of algebra facts and how to prove them.

Implementation

Each term is split into different areas of focus with each area being made up of different small steps to be taken in order to gain full understanding. Year 9 areas of focus are as follows:

- Reasoning with Algebra
 - Straight line graphs
 - Forming and solving equations
 - Testing conjectures
- Constructing in 2 and 3 dimensions
 - Three dimensional shapes
 - Constructions and congruency
- Reasoning with Number
 - Numbers
 - Using percentages
 - Maths and money
- Reasoning with Geometry
 - Deduction
 - Rotation and translation
 - Pythagoras' Theorem

Impact

In year 9 students are encouraged to make links between solving equations and the graphs of those equations. Their algebra skills are used to solve problems in all of the possible contexts seen in KS3 so far.

Number is examined through real life contexts such as tax and interest. Non-calculator and calculator methods are taught in conjunction with students trained to choose the most effective in different situations.

Geometry is the greatest focus through the first two terms of year 9. Previous learning is recapped to ensure students are not only confident when recalling the facts but fully understand them and how to use them. Entirely new concepts are also introduced such as vectors and Pythagoras to combine numerical and geometrical knowledge. Effective use of calculators is also a priority during these units.

The final two units of the KS3 curriculum further improve problem solving and reasoning skills. Skills are developed across a topic range with the aim that students are given experiences that allow them to see how mathematical skills can be applied to solve a

- Reasoning with proportion
 - Enlargement and similarity
 - Solving ratio and proportion problems
 - Rates
- Representations
 - Solving problems using graphs, tables and algebra

Assessment

- Each lesson provides opportunity for assessment.
- Formal assessment takes place at the end of each block.
- Two summative assessments take place in year 9, one in the autumn term and one in the summer during assessment week.
- Each type of assessment aims to inform planning and delivery and is based on guidance from White Rose Maths and the NNW maths hub work on mastery in mathematics.

range of problems, problems that will be beneficial in their future lives and careers and beneficial in the way that they allow the student to demonstrate their mathematical fluency and ability to be a problem solver.

Key Knowledge and Skills Cross Curricular

Opportunities will be taken where appropriate, on a lesson by lesson basis, to make links with other subject areas in school, with financial maths and career opportunities. These are highlighted on lesson PowerPoints.