Mathematics

Year Group 7

Autumn Term 1

Number of weeks	**Algebraic Thinking**
2	Sequences
2	Understand and use algebraic notation
2	Equality and equivalence

Reasons behind order of topic in this half term

- The first week is used to explore sequences using diagrams and lists of numbers. Technology is used to display graphs to get students to understand the difference between linear and non-linear patterns. Calculators are used throughout so that number skills are not a barrier. Sequences are covered formally at a later date.
- Function machines are used alongside bar models and letter notation. Single function machines are then linked to inverse operations before moving into two step machines and then abstract expressions.
- Students are then introduced to the use of number machines to formally solve one and two step equations. Consideration of equivalence and the difference between equality is illustrated through collecting like terms.

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Autumn Term 2

Number of Weeks	**Place Value and Proportion**
3	Place value and ordering integers and decimals
3	Fraction, decimal and percentage equivalence

Reasons behind order of topic in this half term

- In this block, students will explore integers up to one billion and decimals to hundredths. Using and understanding number lines is key and explored in depth. Rounding to the nearest ten is developed alongside rounding to one significant figure. Topics from last term such as sequences and equations, will be interleaved into this block of teaching.
- Building on the recent work on decimals, the key focus for the second half of this term is for students to gain a deep understanding of the links between fractions, decimals and percentages. Whilst looking at percentages, pie charts are introduced. The focus is very much on a secure understanding of the most common fractions under one.

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Spring Term 3

Number of Weeks	**Applications of Number**
2	Solving problems with addition & subtraction
3	Solving problems with multiplication and division
1	Fractions & percentages of amounts

Reasons behind order of topic in this half term

- The focus on the first two weeks is building on the formal methods of addition and subtraction at KS2. All students will look at this in context of interpreting and solving problems. Problems are drawn from the contexts of perimeter, money, interpreting bar charts and tables. Calculators are used to check or support calculations with significant figures.
- The rest of the term is dedicated to study multiplication and division both with and without a calculator. Unit conversions will be the main context as multiplication of 10,100 and 1000 are explored.
- The short block focuses on the key concept of working out fractions and percentages of quantities and linking the two.

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Spring Term 4

Number of Weeks	**Directed Number and Fractional Thinking**
3	Operations and equations with directed number
3	Addition and subtraction of fractions

Reasons behind order of topic in this half term

- Students have limited exposure to directed number at KS2, so this block is to extend their prior knowledge and deepen their understanding. Multiple representations and contexts are used to appreciate the meaning behind operations with negative numbers rather than relying on a series of rules.
- Fractional thinking builds on the Autumn term of fractions, decimals and percentages. Bar models and diagrammatic representations are used to support this. Adding fractions with the same denominators will be restricted to cases where one is a multiple of the other.

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Summer Term 5

Number of Weeks	**Lines and Angles**
3	Constructing, measuring and using geometric notation
3	Developing geometric reasoning

Reasons behind order of topic in this half term

- Students will build on their KS2 skills using rulers, protractors and other measuring equipment to construct and measure increasingly complex diagrams using correct mathematical notation. Pie charts will be studied here to gain further practise at drawing and measuring angles.
- The second block covers basic geometric language, names and properties of types of triangles and quadrilaterals, and the names of other polygons. Angle rules are introduced and used to form chains of reasoning.

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Summer Term 6

Number of Weeks	**Reasoning with Number**
2	Developing number sense
2	Sets and probability
2	Prime numbers and proof

Reasons behind order of topic in this half term

- Students will review and extend their mental strategies with a focus on using a known fact to find other facts. The skills gained in working with number facts will be extended to known algebraic facts.
- FDP equivalence will be revisited in the context of probability, where students will also be exposed to sets, set notation and systematic listing strategies.
- Factors and multiples are revisited to introduce the concept of prime numbers, and the higher ability groups will include Venn diagrams. Odd, even, prime, square and triangular numbers will be used as the basis of forming testing conjectures.

Reasons behind order of topics in this Year

All of the topics in the maths scheme maths can be interwoven and linked in one way or another. The topics are in the current order to allow the students to build upon previous knowledge. Without the pre-requisite knowledge from the topic before, it is very difficult for students to attempt problems solving tasks or develop a mastery of the topic.