

## Year 7 Autumn Half Term 1

Overarching topic: Number - Written/mental methods, negatives, BIDMAS, decimals and rounding			
Why is this topic being studied at this time?	Students have good number skills when they leave KS2, but this declines during the Summer holiday. This will help to bridge the gap between KS2 and KS3. Also, primary schools tend to teach it at to different level and we need to ensure an even starting point. We can extend the teaching but we need a solid foundation.		
How does it fit into the wider subject curriculum?	It underpins the foundations of Mathematics (and science). Being numerate is essential: we are then able to solve problems for specific situations involving known values.		
	Critical	Core	Pinnacle
<b>The Big questions</b> (what questions will students be able to answer with mastery of this topic?)	Can we use all four operations? Do we understand the concept of the number line? Can we definite BIDMAS and understand the importance of ORDER? Place value: what's the impact? Can we define percentage: what's the impact? How are numbers rounded to nearest: whole number, 10, 100 etc?	Can we: apply the four operations to written/mental methods? - use negatives in all four operations? - apply the BIDMAS to numerical questions? - manipulate fractions? - use the four operations with decimals? How do we identify bounds?	What are the alternative methods to use? E.g Chinese/Russian methods? How is rounding to significant figures different to decimal places? How can we calculate with bounds?
<b>The Key skills/techniques</b>	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge		
	Skill/technique	How will this skill be developed?	
	Application	Through practice, repetition and modelling of various methods.	
Throughout year 7 and 8, alongside the content in the provision map here, students will embrace the statistics elements of the curriculum through a bespoke set of projects integrating the use of technology. This will help to develop their skills using Excel and other mathematical software while covering various aspects of data handling and data analysis.			

## Year 7 Autumn Half Term 2

Overarching topic: Number - Fractions and percentages				Algebra - Expressions and formulae			
Why is this topic being studied at this time?		An understanding of fractions and percentages is important for use across many real life contexts as well as within other areas of Mathematics. Following this, the students need to start algebra early as it underpins the reasoning behind how maths works. Again, primaries may teach these aspects and if they do, they do so at different levels. Therefore we need to set a foundation for our students.					
How does it fit into the wider subject curriculum?		The work here on fractions and percentages builds on from the work with integers and decimals at the start of the year. This helps to further secure the fundamental concepts of number before branching into other areas of the curriculum.  Learning algebra is a little like learning another language. In fact, algebra is a simple language, used to create mathematical models of real-world situations and to handle problems that we can't solve using just arithmetic. It is absolutely key to unlocking many careers in the Sciences.					
		Critical		Core		Pinnacle	
The Big questions (what questions will students be able to answer with mastery of this topic?)		What is a fraction?  Why do we use letters in maths? What are the key terms?		Can we manipulate fractions? Can we calculate percentages of amounts?  How/why do we use letters in maths? How does substitution work? How do we simplify expressions? How can we manipulate expressions into and out of brackets? Can we substitute into a formula?		What is a reciprocal? How do we find simple/compound interest? E.g. mortgages, loans, interests  How can we use exchange rates to help us convert currencies etc.? How is an original amount found following a percentage change?  Can we use interesting formulae? e.g. celsius to fahrenheit, imperial to metric	
The Key skills/techniques		The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge					
		Skill/technique		How will this skill be developed?			
		Application		Move on from numerical to worded.			
Throughout year 7 and 8, alongside the content in the provision map here, students will embrace the statistics elements of the curriculum through a bespoke set of projects integrating the use of technology. This will help to develop their skills using Excel and other mathematical software while covering various aspects of data handling and data analysis.							

## Year 7 Spring Half Term 1

Overarching topic: Geometry - Perimeter and area			
Why is this topic being studied at this time?	Fundamental number skills were learnt in term 1 and are now being used in real-life contexts. Furthermore, it builds on from algebraic concepts to extend this material.		
How does it fit into the wider subject curriculum?	<i>"As long as algebra and geometry proceeded along separate paths, their advance was slow and their applications limited. But when these sciences joined company, they drew from each other fresh vitality and thenceforward marched on at a rapid pace toward perfection. "</i> (Joseph Louis de Lagrange 1914) Geometry is used in careers such as architecture, transport, engineering, construction and medicine.		
	Critical	Core	Pinnacle
<b>The Big questions</b> (what questions will students be able to answer with mastery of this topic?)	What is the difference between area and perimeter? What units are used for area and perimeter? What is a net of a shape? What is circumference and the distinction between this and perimeter? What is Pi?	How is the perimeter of polygons calculated? What are the formulae for the areas of triangles, quadrilaterals and circles? How is a circumference calculated? How is a prism's surface area calculated?	How are algebraic expressions formed across geometry? How can the area formulae be proved? How does a sector change the calculation of area/arc length? How are surface areas of pyramids calculated?
<b>The Key skills/techniques</b>	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge		
	<b>Skill/technique</b>	<b>How will this skill be developed?</b>	
	To apply all four operations	Learnt in term 1, recognise correct operation to use, carry out the calculation.	
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## Year 7 Spring Half Term 2

Overarching topic: Algebra - Equations and formulae		Ratio and Proportion	
Why is this topic being studied at this time?	These topics both build on the algebra and number content covered previously and help to demonstrate how the basics can be applied to more challenging ideas and in context in the real world.		
How does it fit into the wider subject curriculum?	“When the ancients discovered ‘Phi’, they were certain they had stumbled across God’s building block for the world.” Dan Brown, The Da Vinci Code. Phi - the golden number - can be seen in many different spiralling natural objects, from molluscs' shells to the position of leaves on a stem. Work on ratio and proportion helps to see how aspects are related and compared from the basics of mixing paints or sharing sweets to the more complex ideas of ratio seen in the natural world.		
	Critical	Core	Pinnacle
<b>The Big questions</b> (what questions will students be able to answer with mastery of this topic?)	How do we find a value of the unknown? What is a ratio and how is it used? What does being in proportion mean?	Using all prior skills, can we solve any linear equation? Can we rearrange any formula? How are ratios applied to a problem? How is direct proportion used to help us choose the best value product?	How can we change the subject when there are two terms with the subject involved? Can we work with algebraic area problems? How are ratio problems solved in reverse?
<b>The Key skills/techniques</b>	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge		
	<b>Skill/technique</b>	<b>How will this skill be developed?</b>	
	Application	Through practice, repetition and modelling of various methods.	
	Application	By picking apart worded problems using methods like UNPACK	
Throughout year 7 and 8, alongside the content in the provision map here, students will embrace the statistics elements of the curriculum through a bespoke set of projects integrating the use of technology. This will help to develop their skills using Excel and other mathematical software while covering various aspects of data handling and data analysis.			

## Year 7 Summer Half Term 1

### Overarching topic: Geometry - Angles

Why is this topic being studied at this time?	Having now developed an understanding of various number topics and the basics of shape, students now extend this to revisit the idea of angles from primary and extend to secondary concepts.		
How does it fit into the wider subject curriculum?	Angles are used throughout geometry to describe shapes and the behaviour of lines. They have a lot of applications in other subjects and the real world particularly in roles around engineering or design.		
	Critical	Core	Pinnacle
<b>The Big questions</b> (what questions will students be able to answer with mastery of this topic?)	What constitutes an angle? What are the different types of angles? How can an angle be measured?	What angle facts are there? What is special about angles in parallel lines? What is special about angles in polygons?	Can we calculate bearings?
<b>The Key skills/techniques</b>	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge		
	<b>Skill/technique</b>	<b>How will this skill be developed?</b>	
	Literacy	Exposure in lessons: use in different contexts. Use recall to reinforce vocabulary.	
	Use of a protractor	Practise accurate measuring of angles, check rules work using measuring.	
Throughout year 7 and 8, alongside the content in the provision map here, students will embrace the statistics elements of the curriculum through a bespoke set of projects integrating the use of technology. This will help to develop their skills using Excel and other mathematical software while covering various aspects of data handling and data analysis.			

## Year 7 Summer Half Term 2

Overarching topic: Probability			
Why is this topic being studied at this time?	Previous knowledge on decimals, fractions and percentages will help to set the foundations for Probability. This can also help build into the Statistics work being carried out in parallel.		
How does it fit into the wider subject curriculum?	<i>"It is remarkable that a science which began with the consideration of games of chance should have become the most important object of human knowledge. "</i> Pierre-Simon Laplace (1865) Probability underpins all games of chance all the way up to the heights of the gambling industry. Understanding how to calculate probabilities can help individuals make decisions in the short term but also help companies and industries make decisions in the long term.		
	Critical	Core	Pinnacle
<b>The Big questions</b> (what questions will students be able to answer with mastery of this topic?)	What is probability? What is the probability scale? What is the language (terminology and notation) of probability theory? How are fractions, decimals and percentages converted?	How do we calculate probabilities in mutually exclusive, independent scenarios. How do we calculate expectations? How do we identify outcomes with sample space diagrams? What is a tree diagram and how is it used?	What impact do combined events have on probability? How can algebra be involved with probability? Can I interpret probabilities in context?
<b>The Key skills/techniques</b>	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge		
	<b>Skill/technique</b>	<b>How will this skill be developed?</b>	
	Literacy	Exposure in lesson through contextual problems. Describing situations for themselves.	
	Application	Practice using probability concepts in a range of scenarios	
Throughout year 7 and 8, alongside the content in the provision map here, students will embrace the statistics elements of the curriculum through a bespoke set of projects integrating the use of technology. This will help to develop their skills using Excel and other mathematical software while covering various aspects of data handling and data analysis.			

## Year 7 and 8 Statistics Work

Overarching topic: Statistics			
Why is this topic being studied at this time?	A knowledge of data handling and analysis skills is vital in so many aspects of life, this will be studied alongside the rest of the curriculum so that it can be gradually built upon and developed. A range of technology will be integrated to support students in improving these skills at the same time.		
How does it fit into the wider subject curriculum?	<i>"There are three kinds of lies: lies, damn lies and statistics"</i> attributed to former British Prime Minister Benjamin Disraeli, it suggests that statistics can be produced in particular ways to persuade people of a point of view. For this reason, it is vital that we are able distinguish between reliable and suitable statistics and those that aren't. Statistics are also used in most careers to analyse and present information.		
	Critical	Core	Pinnacle
<b>The Big questions</b> (what questions will students be able to answer with mastery of this topic?)	What are averages and spreads and how are they calculated from listed data?  What is the difference between discrete and continuous data?  What types of frequency charts are there?	How are averages and spreads calculated from frequency tables? How can pie charts be drawn and how are they interpreted? What is a stem and leaf diagram and how are they used?  How can a time series graph be drawn and used?	How are averages chosen to represent data in the best way? How can statistics be manipulated? Why do we use multiple averages and measures of spread?  What is a moving average? How are charts and graphs chosen to represent data?
<b>The Key skills/techniques</b>	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge		
	Skill/technique	How will this skill be developed?	
	Literacy	Exposure in lessons: use in different contexts. Use recall to reinforce vocabulary.	
	Application	Understand Charts: draw and interpret charts.	
Throughout year 7 and 8, alongside the content in the provision map here, students will embrace the statistics elements of the curriculum through a bespoke set of projects integrating the use of technology. This will help to develop their skills using Excel and other mathematical software while covering various aspects of data handling and data analysis.			