

• NAME		TEACHER				
My GCSE Target Grade is		End of Cycle Teacher Assessment Please circle				
		SAE	AE	E	BE	SBE
End of unit assessment type		Your end of topic assessment will be a written exam.				

YEAR 11 CROSSOVER CYCLE 1: NUMBER, RATIO & ALGEBRA

	Knowledge	Prior knowledge	End of topic
Number	Indices, powers and roots – I know and can use the laws of indices to simplify expressions		
	Standard Form – I can write large numbers in standard form and convert into ordinary numbers and I can write small numbers in standard form and convert into ordinary numbers		
	Standard Form Calculations – I can multiply and divide numbers in standard form and add and subtract numbers in standard form		
	Prime Factors - I can use find the HCF of a pair of numbers and use prime factor decomposition to list the prime factors of a number		
Ratio	Ratio Problems – I can solve problems involving ratios and fractions (including with measures and shapes)		
	Sharing in a Ratio – I can divide a quantity into 2 and 3 parts in a given ratio and solve worded problems		
	Compound Measures – I can solve problems involving Speed, Distance and Time and Density, Mass and Volume.		
	Exchange Rates – I can calculate using exchange rates and decide which is better value		
	Best Buy Problems – I can calculate using the unitary method which item is best value in a 'Best Buy' problem		
Algebra	Expanding Brackets – I can expand single & double brackets and apply to problem solving questions involving shapes		
	Factorising – I can factorise linear and quadratic expressions and use to simplify simple algebraic fractions		
	Solving Quadratics - I can factorise to solve quadratic equations of the form $x^2 + bx + c = 0$		
	Solving Equations – I can solve equations involving brackets, unknowns on both sides and fractions and I am confident leaving my answer as a fraction		

LEARNING TOOLS				
MY KEY TOPICS	KEY TOPIC 1			
	KEY TOPIC 2			
KEY WORDS	Solve	Rearrange	Pressure	Density
KEY EQUATIONS	Force = P _____ x A _____ Mass = D _____ x V _____			
PRE-LEARNING	Cycle 1 HegartyMaths Videos: <ul style="list-style-type: none"> • 122 (Standard form to ordinary) • 332 (Share in a given ratio 1) • 223 (Factorise Quadratic Expressions 1) 			
CAREERS	<p>An astronomer needs standard form as they are working with such enormous numbers considering planets are so far away. A scientist needs standard form as well since they are working with small numbers too, such as when dealing with microbes.</p> <p>Quadratic equations are often used to describe the motion of objects that fly through the air. If you plan to join the military and work with artillery or tanks, then you will regularly use the quadratic equation to predict where shells will land.</p>			

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YEAR 11 CROSSOVER	CYCLE 2: SHAPE & DATA
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	Knowledge	Prior knowledge	End of topic
Fractions	Fractions 1 – I can convert from mixed to improper fractions and vice versa		
	Fractions 2 - I can add subtract, multiple and divide fractions and mixed numbers		
	Algebraic Fractions – I can simplify, add & subtract basic algebraic fractions by finding the LCM		
Shape	Circles 1 – I can find the area and circumference of a circle, semi-circle and quarter circle and solve real problems involving circles		
	Circles 2 - I can solve problems involving circles with and without a calculator (leaving my answer in terms of π if needed)		
	Sectors of Circles – I can apply circles formulae to calculate arc lengths , angles & areas of sectors		
	Volume of 3D Shapes – I can work out the volume of a cube, cuboids and prisms and apply to real problems. I can work out the volume of a cylinder and apply to real problems.		
	Cones & Spheres – I can work out the volume and surface area of a cone and sphere, given the formula		
	3D Shapes – I can recognise 3D shapes and their properties and describe them using the correct mathematical language and understand the 2D shapes that make up the 3D objects		
	Plans & Elevations – I can identify and sketch planes of symmetry of 3D shapes and draw plans and elevations of 3D shapes		
	Vectors 1 – I can add and subtract vectors both in a column and on a grid (write and draw)		
	Vectors 2 - I can find the resultant of two vectors and find multiples of a vector and represent both in a column vector and drawn on a grid		
	Vector Problem Solving – I can solve geometric problems in 2D using vector methods and apply to simple geometric proofs		
Data	Frequency Polygons – I can construct and use frequency polygons		
	Scatter Graphs – I can plot and interpret scatter graphs and determine if there is a relationship between two variables AND use a line of best fit to estimate values		
	Probability Trees – I can draw and use frequency trees and use probability tree diagrams		
	Two Way Tables – I can use two way tables to calculate conditional probability		
	Cumulative Frequency – I can draw and interpret cumulative frequency tables and diagrams and work out the median, quartiles and interquartile range		
	Box Plots – I can draw and interpret box plots and make comparisons by commenting on the median and spread of data of two box plots		

LEARNING TOOLS		
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MY KEY TOPICS	KEY TOPIC	
	π (pi)	π (pi) is the relationship between the _____ and _____ of a circle
KEY QUESTIONS	What does h represent in the formula below?	What does r represent in the formula below?
KEY EQUATION	Volume of a Cylinder = $\pi r^2 h$	
PRE-LEARNING	Y11 Crossover Cycle 2 Hegarty Maths Videos: <ul style="list-style-type: none"> • 63 (Improper fractions to mixed numbers) • 546 (Area of a sector 1) • 322 (Vectors 1: Vectors & Scalars) • 437 (Cumulative frequency diagrams 1) 	
CAREERS	<p>A surveyor uses mathematical calculations, like elevations, shapes and dimensions with tools and equipment to take measurements of land for private, government and public developments. Other job duties include visiting various job sites to take measurements, measuring angles and distances on different properties to determine legal construction boundaries.</p> <p>Economists conduct research and analyse trends on a wide range of economic phenomena, including prices, employment, production, inflation and business cycles. Scatter plots help visually illustrate relationships between two economic phenomena, such as employment and output, inflation and retail sales, and taxes and economic growth.</p>	

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YEAR 11 CROSSOVER	CYCLE 3: NUMBER & PROPORTION
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	Knowledge	Prior knowledge	End of topic
Number	Percentage Change – I can express a given number as a percentage of another		
	Percentages of Amounts – I can find a percentage of an amount and calculate percentage increases or decreases		
	Growth and Decay – I can find an amount after a repeated percentage change (compound interest and depreciation)		
	Reverse Percentages – I can find the original amount given the final amount after a percentage increase or decrease		
Triangles	Pythagoras Theorem – I can use Pythagoras theorem in problem solving questions (applications of the rule in a different context)		
	Trigonometry – I can use the sine, cosine and tangent ratios to calculate a missing sides and angles in right angled triangles and apply to problem solving questions		
	Exact Trig Values – I know the exact values of sin, cos and tan of 0, 30, 45, 60 and 90 degrees and can solve problems involving trigonometry without a calculator		
Proportion	Compound Measures – I can convert between metric speed measures and use <i>Speed = Distance / Time</i> to calculate speed and acceleration		
	Compound Measures 2 – I can use compound measures to solve problems applied to shapes (including <i>Density = Mass / Volume</i>)		
	Describing Enlargements – I can identify the scale factor of an enlargement and find the centre of enlargement to describe the transformation		
	Combined Transformations – I can transform shapes using more than one transformation and describe on a co-ordinate axis		
	Direct Proportion – I can write and use equations involving the constant of proportionality (k) to solve problems involving direct proportion		
	Direct Proportion 2 – I can solve problems involving square and cubic proportionality and apply to problem solving questions involving compound measures		
	Inverse Proportion - I can write and use equations involving the constant of proportionality (k) to solve problems involving inverse proportion		
	Similar Shapes – I understand the properties of similar shapes and can find the scale factor of an enlargement between two shapes		
	Similar Shapes 2 – I can use similarity to find unknown lengths and missing angles and calculate perimeters of similar shapes		

LEARNING TOOLS				
MY KEY TOPICS	KEY TOPIC 1			
	KEY TOPIC 2			
KEY WORDS	Inverse	Enlargement	Origin (0,0)	Similar
KEY EQUATION	SOH CAH TOA			
PRE-LEARNING	Y11 Crossover Cycle 3 HegartyMaths Videos: <ul style="list-style-type: none"> • 94 (Compound Interest) • 508 (Trigonometry: Introduction) 		<ul style="list-style-type: none"> • 721 (Speed 6) • 656 (Combined transformations 1) • 342 (Inverse Proportion) 	
CAREERS	Store clerks will need to use percentage of amounts when calculating the new sale price of items in the shop if there are discounts on. Textile designers might use similar shapes when coming up with a new print and design.			

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YEAR 11 CROSSOVER CYCLE 4: ALGEBRA & SHAPE

Knowledge		Prior knowledge	End of topic
Algebra	Simultaneous Equations - I can solve simultaneous equations where one or both equations need changing and apply to worded problems		
	Factorising – I can factorise linear expressions with multiple terms and apply to problems		
	Algebraic Fractions – I can use factorisation to simplify simple algebraic fractions		
	Forming & Solving Equations – I can form expressions and solve equations from a worded problem, angles problem and area / perimeter problem		
	Inequalities – I can use the correct notation to show greater than, less than and equal to		
	Inequalities 2 – I can identify whole numbers which satisfy an inequality and represent inequalities on a number line		
	Solving Inequalities – I can solve linear inequalities and represent solutions on a number line		
Probability	Rearranging Formulae – I can change the subject of a formula with one step as well as unknowns on both sides.		
	Relative Frequency – I understand that probabilities add up to 1 and can solve problems involving relative frequency		
	Probability Trees – I can draw and use frequency trees and use probability tree diagrams		
	Conditional Probability – I can decide if two events are independent & draw and use tree diagrams to calculate conditional probability (with and without replacement)		
Shape	Venn Diagrams – I can draw and interpret Venn diagrams with 2 or more sets and use to calculate conditional probability		
	Angles - I can find unknown angles in special triangles and give reasons for my calculations		
	Angles in Parallel Lines – I can understand and use the angles properties in parallel lines and find missing angles using corresponding, alternate and supplementary angle rules		
	Angles in Polygons - I can calculate the interior and exterior angles of regular polygons		
	Bearings – I can find three figure bearings and use angles at parallel lines to work out bearings		
	Bearings 2 – I can solve problems involving bearings and scale diagrams		
	Constructions – I can use a compass to complete angle and perpendicular bisectors		
Loci – I can use a compass to draw the locus of a point and use to solve problems			

LEARNING TOOLS

MY KEY TOPICS	KEY TOPIC 1			
	Bearing	Used by planes and ships, must always include 3 digits, start from north and rotate clockwise		
KEY WORDS	Roots	Elimination	Locus	Intersection
KEY EQUATIONS	Interior $(n-2) \times 180$	Exterior $360/n$	where n is the number of sides	
PRE-LEARNING	Y11 Crossover Cycle 4 Hegarty Maths Videos: <ul style="list-style-type: none"> • 190 (Simultaneous equations by elimination 1: intro) 		<ul style="list-style-type: none"> • 356 (Experimental probability & relative frequency) • 492 (Bearings 1) 	
CAREERS	Computer science: Programmers can use Venn diagrams to visualize computer languages and hierarchies. Construction Workers: People involved with constructing houses and buildings need to know lots of geometry. Components like walls need to be kept straight and aligned, with triangle shapes added to give the required strength.			

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YEAR 11 CROSSOVER	POST MOCK
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Knowledge		Prior knowledge	End of topic
Post Mock	21 Exam Papers – First 4 questions from each		
	Sequences Skills – I can generate the terms in a sequence given the nth term, draw a sequence pattern and find the nth term of a linear sequence		
	Averages from a Table – I can work out averages from data that is grouped in a frequency table, including the mean and median.		
	Ratio – I can solve problems involving ratio (including with many parts and fractions)		
	Transformations – I can solve problems involving Rotation, Reflection, Translation and Enlargement.		
	Number – Ordering Integers / FDP, Ordering Fractions, Long Multiplication and Division		
	Pie Charts – I can draw pie charts from a frequency table and interpret pie charts		
Coordinate Geometry	Equation of a Line – I understand and can use $y = mx + c$ and $ax + by = c$ to represent the equation of a straight line and can identify the x and y intercepts		
	Gradient – I can find the gradient of a line between 2 points, with and without a graph		
	Line Segments - I can find the co-ordinates of the midpoint of a line segment and find the gradient and length of a line segment (using Pythagoras)		
	Parallel & Perpendicular Lines – I can find the equation of parallel and perpendicular lines, given the gradient and a point, 2 points and from a diagram		
Grade 7+ Topics	Algebraic Proof – I can describe odd, even and consecutive numbers using algebra and prove a result		
	Upper & Lower Bounds – I can calculate using Upper and Lower Bounds and given your answers to a suitable degree of accuracy		
	Quadratic Inequalities – I can solve quadratic inequalities and correctly identify the region(s) that is satisfied by the function		
	Iteration – I can solve quadratic and cubic equations using an iterative process and I am confident rearrange complex equations to reach a given form		
	Completing the Square 1 – I can complete the square for a quadratic function of the form $x^2 + bx + c$ and find the roots of a quadratic equation by completing the square		
	Functions - I can use function notation and write expressions using function machines		
	Composite & Inverse Functions – I can find the result of composite functions and inverse functions		

LEARNING TOOLS				
MY KEY TOPICS	KEY TOPIC 1			
	KEY TOPIC 2			
KEY WORDS	Parallel	Reflect	Segment	Median
KEY EQUATION	$ax^2 + bx + c = 0$			
PRE-LEARNING	Post-Mock HegartyMaths Videos: <ul style="list-style-type: none"> • 427 (Pie Charts 1) • 201 (Gradient of a line segment 1) • 137 (Upper and lower bounds 1) • 322 (Iteration) 			
CAREERS	Aerospace Engineers: They work in designing, constructing and testing aircraft, missiles, and space craft. They use the study of lines to test the functionality of materials and equipment. Statisticians: They spend their time tracking and visualizing various datasets to present digestible information from large sets of numbers. Statistics are crucial for countries to predict population growth, and functions are necessary for carrying out this task.			