Year 9 Foundation SOW

Chapter	Learning objective	Grade	R	A	G
HT1					
Rounding / Approximations	round a whole number (revsion)	2			
	round decimal numbers to a given accuracy (revision)	2			
	identify significant figures	2			
	round numbers to a given number of significant figures	3			
	use approximation to estimate answers and check calculations including money problems	4			
	limit of accuracy ?				
LCM, HCF and prime numbers	identify square numbers and use a calculator to find the square / square root of a number.	2			
	find and recognise multiples / factors of numbers	2			
	identify prime numbers and prime factors	3			
	identify LCM / HCF of two numbers by listing or using prime factorisation (venn diagrams and listing) including real life problems e.g bus times	4			
Percentages	convert a percentage into a fraction / decimal	3			
	express one quantity as a percentage of another	3			
	calculate a percentage of a quantity / simple / compound interest	3			
	increase and decrease quantities by a percentage.	4			
	work out percentage change.	4			
	solve problems involving repeated percentage change.	4			
	calculate the original amount, given the final amount, after a known percentage increase or decrease.	5			
	To use finacial vocabulary VAT, APR, Credit / Debit card, loan, mortgage				
	To calculate the result of repeated percentage changes	5			
Expressions	Use the rules of indices to simplify (revision)	4			
	To simplify algebraic expressions (revision)	3			
	To expand single bracket	3			
	expand and simplify brackets such as 2(5x +3) - 6(x - 5)	5			
	To factorise simple expressions	3			
	To factorise expressions with more than one variable	4			
	To factorise simple quadratic expressions	5			
Standard form	To understand and work with both positive and negative powers of ten	4			
	To write a large or small number in standard form (including writing mass of atoms,distance between planets - review)	4			
	To multiply and divide numbers in standard form	5			
AP1					

Chapter	Learning objective	Grade	R	A	G
	HT2				
Circles and Sectors	calculate the circumference of a circle (fencing problems)	4			
	calculate the area of a circle (cost of a cicular items)	4			
	calculate the length of an arc	5			
	calculate the area and angle of a sector.	5			
Area and volume	calculate the area of a compound shape made from rectangles.	3			
	calculate the surface area and volume of a cuboid.	4			
	calculate the surface area of a prism including cylinders (the cost of wrapping paper)	5			
	calculate the volume of a prism including cylinders	5			
Transformations	To recognise shapes with reflective symmetry and draw lines of symmetry on a shape (rangoli patterns)	2			
	reflect a 2D shape in a mirror line.	3			
	recognise shapes with rotational symmetry and work out the rotational symmetry for a 2D shape	3			
	rotate a 2D shape about a point.	3			
	translate a 2D shape.	3			
	enlarge a 2D shape by a scale factor.	3			
	use more than one transformation.	5			
Similar / Congruent shapes	use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)	5			
	To know how to use map ratios	3			
	To understand and use scale drawings	2			
Sequences	recognise patterns in number sequences.	2			
	generate sequences, given the n th term.	3			
	find the n th term of a linear sequence.	4			
	recognise and continue some special number sequences	3			
	understand how prime, odd and even numbers interact in addition, subtraction and multiplication problems.	3			
	Generate the terms of a quadratic sequence from the n th term.	4			
	AP2				

HT3					
Chapter	**Learning objective**	**Grade**	R	A	G
Pythagoras' theorem.	Calculate the length of the hypotenuse or the shorter in a right-angled triangle.	5			
	Solve practical problems involving Pythagoras' theorem.	5			
Trigonometry	Use the three trigonometric ratios to find the missing length or angle	5			
	work out and remember trigonometric values for angles of 30°, 45°, 60° and 90°.	5			
	solve practical problems using trigonometry	5			
	solve problems using an angle of elevation or an angle of depression.	5			
	solve bearing problems using trigonometry.	5			
Linear graphs	work out the equations of horizontal and vertical lines.	3			
	To recognise and draw the graph of a linear equation using table of values / using a calculator	5			
	work out the gradient of a straight line	5			
	To identify the gradient / y-intercept in a graph from a linear equation	4			
	To work out an equation of the form $y = mx + c$ from its graph	5			
	To draw linear graphs using the gradient and the y-intercept	5			
	work out the equation of a line given two points on the line.	5			
AP3					

HT4				
Chapter	**Learning objective**	**Grade**	R	A	G
Quadratic and Cubic Graphs	To plot quadratic and cubic graphs	4			
	To solve simple quadratic / cubic equations by drawing graphs	5			
Factorising and solving quadratics	write an algebraic expression	4			
	expand and simplify brackets such as 2(5x +3) - 6(x - 5)	4			
	factorise an algebraic expression.	4			
	expand two linear brackets to obtain a quadratic expression.	4			
	factorise a quadratic expression of the form $x^2 + bx + c$ into two linear brackets.	5			
	Solve a quadratic expression of the form $x^2 + bx + c$ by factorising	5			
Functions	Find the output of a function.	4			
Angles	recognise and calculate the angles in different sorts of triangle.	3			
	calculate the sum of the interior angles in a polygon.	5			
	calculate the exterior angles and the interior angles of a regular polygon.	5			
	calculate angles in parallel lines.	4			
	use angle properties in quadrilaterals.	3			
	use a bearing to specify a direction.	3			
AP4				

HT5					
Chapter	**Learning objective**	**Grade**	R	A	G
Ratio and proportion	simplify a ratio	3			
	express a ratio as a fraction	3			
	divide amounts into given ratios	4			
	solve problems involving ratios.	5			
	convert between currencies and measures.	4			
	recognise the relationship between speed, distance and time	3			
	use the formula S = D / T	4			
	find the cost per unit mass / mass per unit cost	3			
	use the unitary method to find which product is better value.	3			
	recognise and solve simple problems that involve direct proportion (decorating)	4			
	solve problems in which two variables have an inversely proportional relationship (inverse variation)	5			
	recognise graphs that show direct variation.	5			
Compound units	To understand and use density and other compound units including pressure and rates of pay	5			
Simultaneous linear equations	solve simultaneous linear equations using the elimination or the substitution method	5			
	solve problems using simultaneous linear equations.	5			
AP5					

Chapter	Learning objective	Grade	R	A	G
	HT6				
Exploring and applying probability	use the probability scale and the language of probability	3			
	calculate the probability of an outcome of an event.	3			
	calculate the probability of an outcome not happening when you know the probability of that outcome happening.	4			
	recognise mutually exclusive and exhaustive outcomes.	4			
	calculate experimental probabilities and relative frequencies from experiments	3			
	predict the likely number of successful outcomes, given the number of trials and the probability of any one outcome.	4			
	apply systematic listing and counting strategies to identify all outcomes for a variety of problems.	4			
Constructions and loci	read and draw scale drawing	3			
	use a scale drawing to make estimates.	3			
	draw nets of some 3D shapes	3			
	identify a 3D shape from its net.	4			
	read from and draw on isometric grids	4			
	interpret diagrams to draw plans and elevations.	5			
	To construct triangles accurately (ASA, SSS, SAS,RHS)	5			
	construct the bisectors of lines and angles	5			
	construct angles of 60° and 90°.	5			
	draw a locus for a given rule.	5			
Statistics: Draw and interpret Charts	draw and interpret pie charts.	4			
	draw, interpret and use scatter diagrams	4			
	draw and use a line of best fit.	4			
	identify the modal group	3			
	calculate an estimate of the mean from a grouped table.	5			
	AP6				

Year 9 Higher SOW

HT1				
Chapter	**Learning objective**	**Grade**	R	A	G
Rounding and approximations	Identify and round numbers to a given number of significant figures (review)	3			
	use approximation to estimate answers and check calculations including money problems	4			
	Find the error interval or limits of accuracy of numbers that have been rounded to different degrees of accuracy/Truncated	6			
	solve problems involving limits of accuracy	7			
LCM, HCF and prime numbers	Identify the LCM and HCF using prime factorisation (venn diagrams and listing) including real life problems e.g bus times	4			
	Find two numbers given their HCF and LCM	5			
	Solve worded problems involving LCM / HCF	5			
Percentages	understand the difference between simple and compound interest				
	To use the multiplier method to calculate the result of a percentage increase or decrease	5			
	solve problems involving repeated percentage change and / or simple interest	5			
	work out percentage change.	4			
	calculate the original amount, given the final amount, after a known percentage increase or decrease.	5			
	solve problems involving algebraic percentages	6			
	Finance and percentage				
Expressions	To simplify complex algebraic expressions	4			
	To expand brackets and simplify / including three brackets	3			
	To expand and factorise expressions with more than one variable	4			
	To factorise quadratic expressions	6			
Subject of a formula	Substitute numbers into formulae (energy bills, speed,mobile bills - with spreadsheet- review)	4			
	Change the subject of complex formulae	6			
Standard form	To understand and work with both positive and negative powers of ten (recap)	4			
	To write a large or small number in standard form (including writing mass of atoms,distance between planets - review)	4			
	To multiply and divide numbers in standard form	5			
	To be able to add and subtract numbers in standard form	6			
	To solve worded problems invoving standard form	6			
AP1				

Chapter	Learning objective	Grade	R	A	G
	HT2				
Circles and Sectors	calculate the circumference of a circle.	4			
	calculate the area of a circle (cost of a cicular items)	4			
	calculate the length of an arc	5			
	calculate the area and angle of a sector.	5			
Volume and surface area	Calculate the volume and the surface area of a prism including cylinders (the cost of wrapping paper)	5			
	Calculate the volume of a pyramid.	6			
	Calculate the volume and surface area of a cone.	6			
	Calculate the volume and surface area of a sphere.	6			
Transformations	Translate, reflect and rotate 2D shapes (revision)	3			
	Enlarge a 2D shape by a positive scale factor given the COE	5			
	Enlarge a 2D shape by a negative/fractional scale factor given the COE	6			
	Combinations of transformations.	6			
Congruency and similiarity	Demonstrate that two triangles are congruent.	6			
	Recognise and show that two shapes are similar	6			
	Solve problems involving the area and volume of similar shapes.	6			
Sequences	generate sequences, given the nth term.	3			
	find the nth term of a linear sequence.	4			
	recognise and continue some special number sequences	3			
	Generate the terms of a quadratic sequence from the nth term.	4			
	Work out the n th term of a quadratic sequence.	8-9			
	AP2				

HT3				
Chapter	**Learning objective**	**Grade**	R	A
Pythagoras' theorem.	• Calculate the length of the hypotenuse or the shorter in a right-angled triangle.	5		
	• Solve problems using Pythagoras' theorem	5		
	• To use Pythagoras' theorem to find the distance between two points	5		
	• **To use Pythagoras' theorem to solve problems in 3 dimensions**	7		
Trigonometry in 2D	• Use the three trigonometric ratios to find the missing length or angle	5		
	• work out and remember trigonometric values for angles of 30°, 45°, 60° and 90°.	5		
	• solve practical problems using trigonometry (including finding heights of mountains, buildings, trees)	5		
	• solve problems using an angle of elevation or an angle of depression.	5		
	• solve bearing problems using trigonometry.	5		
	Use the sine rule and the cosine rule to find sides and angles in any triangle.	7		
Linear graphs	• work out the equations of horizontal and vertical lines.	3		
	• To recognise and draw the graph of a linear equation using table of values / using a calculator	5		
	• work out the gradient of a straight line	5		
	• To identify the gradient / y-intercept from a linear equation	4		
	• To draw linear graphs using the gradient and the y-intercept	5		
	• To work out an equation of the form $y = mx + c$ from its graph	5		
	• work out the equation of a line given two points on the line.	5		
	• work out the equation of a linear graph that is parallel to another line	5		
	• **Work out the equation of perpendicular lines**			
	• **Solve simutaneous equations graphically**			
AP3				

HT4				
Chapter	**Learning objective**	**Grade**	R	A	G
Quadratic and Cubic Graphs	• To plot quadratic and cubic graphs	4			
	• To solve simple quadratic / cubic equations by drawing graphs	5			
Other Graphs	Recognise exponential and reciprocal graphs.	6			
Factorising and solving quadratics	Recognise expressions, equations, formulae and identities.	5			
	To multiply out three brackets	6			
	Factorise a quadratic expression of the form $x^2 + bx + c$ into two linear brackets.	5			
	Factorise a quadratic expression of the form $ax^2 + bx + c$ into two linear brackets ($a \neq 0$)	6			
	• **To recognise and use the difference of two squares**				
	Solve quadratic equations by factorisation.	5			
	Rearrange a quadratic equation so that it can be factorised.	6			
	• Solving quadratic equations using the formula	7			
Functions	Find the output of a function.	4			
	Find the inverse function.	8-9			
	Find the composite of two functions.	8-9			
Angles	Solving problems involving polygons including tiling problems	5			
	To solve problems involving alternate, corresponding, allied and opposite angles.	4			
	To be able to read, interpret and draw bearings diagrams.	3			
	To use the geometrical properties of a diagram to calculate a bearing.	4			
AP4				

HT5				
Chapter	Learning objective	Grade	R	A	G
Ratio and proportion	• divide amounts into given ratios	4			
	• solve problems involving ratios.	5			
	Solve complex problems involving ratios.	7			
	• convert between currencies and measures.	4			
	• recognise the relationship between speed, distance and time	3			
	• use the formula S = D / T	4			
	• use the unitary method to find which product is better value.	3			
	• recognise and solve simple problems that involve direct proportion.	4			
	• solve problems in which two variables have an inversely proportional relationship (decorating)	5			
	• recognise graphs that show direct variation.	5			
Compound units	• To understand and use density and other compound units including pressure and rates of pay	5			
Simultaneous Equations	• Solve simultaneous linear equations graphically and algebraically	5			
AP5				

Chapter	Learning objective	Grade	R	A	G
	HT6				
Exploring and applying probability	Calculate experimental probabilities and relative frequencies.	3			
	Estimate probabilities from experiments.	3			
	Recognise mutually exclusive, complementary and exhaustive events.	4			
	Predict the likely number of successful events, given the number of trials and the probability of any one outcome.	4			
	Read two-way tables and use them to work out probabilities.	4			
	Use Venn diagrams to solve probability questions.	6			
Constructions and loci	• draw nets of some 3D shapes	3			
	• identify a 3D shape from its net.	4			
	• To construct triangles accurately (ASA, SSS, SAS,RHS)	5			
	Construct the bisectors of lines and angles.	5			
	Construct angles of 60° and 90°.	5			
	Draw a locus for a given rule.	5			
	Solve practical problems using loci.	5			
	Construct and interpret plans and elevations of 3D shapes.	5			
Statistics: Draw and interpret Charts	• To interpret a variety of two-way tables	3			
	• draw and interpret pie charts.	4			
	• draw, interpret and use scatter diagrams	4			
	• draw and use a line of best fit.	4			
	• interpret and construct tables and line graphs for time series data and know their appropriate use				
	AP6				