

SENIOR SCHOOL

preparing for the world

Department of Mathematics Module 1– Number

By the end of this unit we will have covered the following areas:

Objective	L	Resource reference	More practice
Identify and use natural numbers, integers (positive, negative and zero), prime numbers, square numbers, common factors and common multiples, rational and irrational numbers (e.g. π , $\sqrt{2}$), real numbers;		Number 1, pg 82 - 86	
Continue a given number sequence; recognise patterns in sequences and relationships between different sequences, generalise to simple algebraic statements (including the nth term) relating to such sequences.		Algebra 1, pg 44-46	
Calculate squares, square roots, cubes and cube roots of numbers.		Number 3, pg 304-306	
Use directed numbers in practical situations (e.g. temperature change, flood levels).		Number 3, pg 313-317	
Use the language and notation of simple vulgar and decimal fractions and percentages in appropriate contexts; recognise equivalence and convert between these forms		Number 2 pg 241-243	
Order quantities by magnitude and demonstrate familiarity with the symbols $=, \neq, <, >, \leq, \geq$		Number 1, pg 86 - 88	
Use the standard form $A \times 10^n$ where n is a positive or negative integer, and $1 \leq A \leq 10$		Number 3, pg 309-311	
Use the four rules for calculations with whole numbers, decimal fractions and vulgar (and mixed) fractions, including correct ordering of operations and use of brackets.		Number 1, pg 66–82, 91–94, Number 3, pg 311-313	
Make estimates of numbers, quantities and lengths, give approximations to specified numbers of significant figures and decimal places and round off answers to reasonable accuracy in the context of a given problem.		Number 1, pg 110-114 Number 2 pg 243-247	
Use an electronic calculator efficiently; apply appropriate checks of accuracy.		Number 2 pg 259 - 266	
Give appropriate upper and lower bounds for data given to a specified accuracy (e.g. measured lengths).		Number 2, pg 247-249	
Calculate times in terms of the 24-hour and 12-hour clock; read clocks, dials and timetables.		Number 1, pg 88 - 91	
EXT: Continue a given quadratic sequence and generalize to simple algebraic equations			
EXT: Sets and Venn diagrams		10 ticks L9/10 pk 6	
EXT Upper and lower bounds in simple problem solving		10 ticks L9/10 Pk 1	

Vocab:



By the end of this unit we will have covered the following areas:

Objective	Resource reference	More practice
Use and interpret vocabulary of triangles, quadrilaterals, circles, polygons and simple solid figures including nets	Pg 3 Ex 2	
Measure lines and angles; construct a triangle given the three sides using ruler and pair of compasses only;	Pg 2 Ex 1	
Construct other simple geometrical figures from given data using protractors and set squares as necessary;	10TICKS L7/8 pk 5pg 5	
Construct angle bisectors and perpendicular bisectors using straight edges and pair of compasses only;	10TICKS L7/8 pk 5pg 3-4	
Read and make scale drawings.	Pg 35 -37 Ex 24	
Calculate unknown angles using the following geometrical properties: angles at a point, angles at a point on a straight line and intersecting straight lines, within parallel lines and angle properties of triangles and quadrilaterals	Pg 4-10 Ex 3-7	
Know and use the angle properties of regular polygons	Pg 11-12 Ex 8	
Use the angle properties within a circle, angle in a semi-circle and angle between tangent and radius of a circle.	Pg 13-14 Ex 9	
Use the following loci and the method of intersecting loci for sets of points in two dimensions: (a) which are at a given distance from a given point (b) which are at a given distance from a given straight line (c) which are equidistant from two given points (d) which are equidistant from two given intersecting straight lines.	Pg 193-196 Ex 20	
MA1 Lock Out Compound from Intruders activity (LOCI)		
Recognise rotational and line symmetry (including order of rotational symmetry) in two dimensions and properties of triangles, quadrilaterals and circles directly related to their symmetries.	Pg 15-16 Ex 10, 11	
EXT: Use the relationships between similar and congruent triangles Challenge 3 investigation “Congruent and similar”	10TICKS L7/8 pk 5pg 11-14 pg 23-28	
*EXT: Know and use the perpendicular bisector of a chord passes through the centre of a circle		
*EXT: Proofs	http://nrich.maths.org/6536 Circles in quadrilaterals	
EXT: Use in addition the following geometrical properties: cyclic quadrilaterals. Investigation http://nrich.maths.org/6624 Cyclic quadrilaterals	10TICKS L7/8 pk 5pg 18	

Vocab: point, line, parallel, bearing, right angle, acute, obtuse and reflex angles, perpendicular, similarity, congruence; LOCI



Department of Mathematics Module 3– Algebra

By the end of this unit we will have covered the following areas:

Objective	L	Resource reference	More practice
Use letters to express generalized numbers	5/ 6	10 ticks L5 PK 5 pg 8/9 10 ticks L6 PK 1 Pg 3/8 Myimaths→algebra→Equations-exp and form→rules and formulae	
Construct simple expressions	5/ 6	10 Ticks L5 PK 5 pg 10/11 10 Ticks L6 PK 1 pg 15/16	
Express basic arithmetic processes algebraically	5/ 7	10 ticks L6 PK 1 pg 11/14 10 ticks L6 PK 1 pg 23/24 Myimaths→algebra→algebraic manipulation→simplifying 1 and 2	
Manipulate directed numbers	5	Pg 315, Ex 11, 12, 13 Myimaths→algebra→Equations-exp and formu→order of operations	
Use brackets and extract common factors	5/ 6	Pg 228 Ex 10, 11 Myimaths→algebra→alg mani→single brackets and factorizing linear	
Transform simple formulae	5/ 7	Pg 229 Ex 12, 13, 14 Myimaths→algebra→Equations-exp and formulae→rearranging 1	
Substitute numbers for words and letters in formulae	5/ 8	Pg 317 Ex13, 14, 15, 16 10 ticks L7/8 Pk 1 pg 19/20 Myimaths→algebra→Equations-exp and formulae→substitution 1,2	
Solve simple linear equations in one unknown	6	Pg 46 Ex 3, 4, 5, 6, 7 Myimaths→algebra→Equations-linear→simple equations Myimaths→algebra→Equations-linear→solving equations	
Set up simple equations	5/ 6	Pg 46 Ex 8 and 9 10 ticks L6 PK 1 Ph	
Solve simultaneous equations in two unknowns(algebraic solution)	7	Pg 216 Ex 4, 5, 6 Myimaths→algebra→Equations-linear→sim equations 1, 2, (3)	
EXT: Solve simple linear inequalities	7	10 ticks L7/8 Pk 4 pg 13	
EXT:Expand products of algebraic expressions (x-p)(x-q)	7	10 ticks L7/8 Pk 3 pg 7/8 Myimaths→algebra→algebraic manipulation→brackets	
EXT : Factorise quadratic expressions of the form $x^2 + bx + c$	8	10 ticks L7/8 Pk 3 pg 8/9	
EXT: Solve quadratic expressions of the form $x^2 + bx + c=0$ by factorisation	8	10 ticks L7/8 Pk 3 pg 10/11	
*EXT: Simplify and add simple algebraic fractions	8	10 ticks L9/10 Pk 4 pg 28 ABC and pg 30 AB	

Vocab: solve, construct, equation, simultaneous equation, eliminating, unknown, subject, expression

Department of Mathematics Module 4– Number Calculations

By the end of this unit we will have covered the following areas:

Objective	L	Resource reference	More practice
Introduction to ratio	4	Myimaths-number-ratio and proportion-ratio introduction 10 TICKS Level 6 Pk 4 pg 3 A, B and C	
Introduction to proportion	5	Myimaths-number-ratio and proportion-proportion 10 TICKS Level 6 Pk 4 pg 11/12 and 15/16	
Calculate a given percentage of a quantity;	4 / 5	Myimaths-number-percentages-percentages of amounts 1 and 2	
Direct proportion	6	pg103 Ex 34 Myimaths-number-ratio and proportion-proportion unitary method	
Divide a quantity in a given ratio	5 / 6	pg102 Ex33 Myimaths-number-ratio and proportion-ratio dividing 1 and 2	
Calculate percentage increase or decrease and profit and loss;	6 / 7	pg238 Ex1, 2 Myimaths-number-percentage-percentage change 1	
Express one quantity as a percentage of another;	7	pg239 Ex3, 4 Myimaths-number-percentages-change as a percentage	
Use given data to solve problems on personal and household finance involving earnings, simple interest and compound interest (knowledge of compound interest formula is not required)	6	pg98 Ex29, 30 Myimaths-number-money and finance-simple interest	
Use scales in practical situations;	5	pg101 Ex 31, 32 Myimaths-shape-scale and similarity-map scales	
Calculate average speed.	7	pg 108 Ex 38 Myimaths-shapes-measures-speed	
Convert between different currencies		pg107 Ex37	
EXT:Money and finance		Mobile phone activity	
Ma The golden ratio		Drop dead gorgeous	

Vocab: Ratio, proportion, golden ratio, increase, decrease, profit, loss, average speed, value

Department of Mathematics Module 5– Indices and Graphing

By the end of this unit we will have covered the following areas:

Objective	L	Resource reference	More practice
Use and interpret positive, negative and zero indices.	7 / 8	Myimaths-number-power and roots-Indices 1 and 2 pg307 Ex 3	
Simplifying indices	7	pg307/308 Ex4, 5 Myimaths-algebra-algebraic manipulation-simplifying 2	
Demonstrate familiarity with Cartesian co-ordinates in two dimensions,	5	Myimaths-algebra-graphs-coordinates 2	
Interpret and use graphs in practical situations including travel graphs and conversion graphs,	6	pg137 Ex6, pg219 Ex 7, 8, 9 Myimaths-algebra-graphs-conversion graphs and real life graphs	
Draw graphs from given data	6	pg137 Ex6, pg219 Ex 7, 8, 9 Myimaths-algebra-graphs-drawing graphs	
Construct tables of values for functions of the form $ax + b$, $\pm x^2 + ax + b$, ($x \in \mathbb{R}$) where a and b are integral constants;	8	pg53 -60 Ex 10 - 15	
Draw and interpret such graphs for functions of the form $ax + b$, $\pm x^2 + ax + b$, ($x \in \mathbb{R}$) where a and b are integral constants;	8	pg53 -60 Ex 10 - 15	
Find the gradient of a straight line graph;	6	pg 57 Ex12 Myimaths-algebra-graphs-gradients	
Interpret and obtain the equation of a straight line graph in the form $y = mx + c$;	6 / 7	pg 58 Ex 13, 14, 15 Myimaths-algebra-graphs-equation of a line 1, 2	
MA:Use video analysis to create distance time graphs			
MA: “Problem page” activity		Interpreting graphs in real life	
Construct tables of values and draw and interpret such graphs for functions of the form a/x ($x \in \mathbb{R}$) where a and b are integral constants			
EXT: Solve linear and quadratic equations approximately by graphical methods.	7 / 8	pg60 Ex 15	
EXT: Determine the equation of a straight line parallel to a given line.		Myimaths-algebra-graphs-equation of a line 2	

Vocab: indices, index, plot, draw, interpret, construct, values, function, constant, distance, speed, time, solve, substitute,

Department of Mathematics Module 6– Mensuration

By the end of this unit we will have covered the following areas:

Objective	L	Resource reference	More practice
Carry out calculations involving the perimeter and area of a rectangle and triangle	4 / 6	pg 26 Ex 17, 18 Myimaths-shape-area and perimeter-perimeter, area of rectangles, area of a triangle	
Carry out calculations involving the circumference and area of a circle	6	pg17 Ex 12, 13, 14, 15 and 16 Myimaths-shape-area and perimeter-circumference and area of a circle	
Carry out calculations involving the area of a parallelogram and a trapezium	6 / 7	pg 28 Ex 19 Myimaths-shape-area and perimeter-area of a parallelogram and trapezium	
Carry out calculations involving the volume of a cuboid, prism and cylinder	6 / 7	pg 30 Ex 21, 22, 23 Myimaths-shape-volume and surface area- Volume of cuboids, prism and cylinders	
Carry out calculations involving the surface area of a cuboid and a cylinder	6 . 7	pg 31 Ex 21, 22 Myimaths-shape-volume and surface area-vol of cylinders and nets, surfaces areas	
Ma “Royal Liver clock”		Bowland investigation “Royal liver clock” sheet	
Ext: Approximation of PI using polygons		Archimedes method to estimate PI using Geogebra	

Vocab: Perimeter, area, rectangle, triangle, circle, diameter, circumference, radius, radii, centre, parallelogram, perpendicular height, base, volume, cylinder, prism cross section, surface area, cuboid.