Bellerive FCJ Catholic College

Department: Mathematics **Year Group: 9**

Half Term	Learning Focus	Key Knowledge and Skills	Assessment	Challenge and Enrichment
1	Straight Line Graphs	• Lines parallel to the axes, $y = x$ and $y = -x$ & knows equation of axis • Using a table of values • Compare gradients (understands the effect of changing coefficient of x & positive vs negative gradient) • Compare intercepts (understanding where to find a y-intercept & its meaning) • Understand and use $y = mx + c$ • Find the equation of a line from a graph • Interpret gradient and intercepts of a real-life graph • **Write an equation in the form y= mx + c (H)** • **Model real-life graphs involving inverse proportion (H)** • **Explore perpendicular lines (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/452824354 https://vimeo.com/452824565 https://vimeo.com/454341611 https://vimeo.com/454341239 https://vimeo.com/455754952
	Forming and Solving Equations	• Solve one and two step equations and inequalities • Solve inequalities with negative numbers and brackets • Solve equations and inequalities with unknowns on both sides • Solve equations and inequalities in context • Substituting into formulae and equations • Rearranging formulae – one and two step • **Rearranging more complex formulae with brackets and squares (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/457714202 https://vimeo.com/457715289 https://vimeo.com/457716336 https://vimeo.com/457716360 https://vimeo.com/458885948 https://vimeo.com/458899991 https://vimeo.com/458886226
	Testing Conjectures	• Factors, multiples and primes • Prime factor decomposition • Testing conjectures	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered.	https://vimeo.com/461311096 https://vimeo.com/461311367 https://vimeo.com/461315141

		• Are statements always, sometimes or never true (evaluating statements to determine validity) • Show that (basic proof introduction) • Conjectures with number (using odds and evens to determine outcome) • Expanding double brackets (pair of binomials) • Conjectures with algebra (testing to determine validity) • Explore the 100 grid (investigations) • Expanding triple brackets **(H)**	Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/461316570 https://vimeo.com/461319192
2	Three-Dimensional Shapes	• Know names of 2D and 3D shapes • Recognise prisms (including language of edges/vertices) • Draw accurate nets of cuboids and other 3D shapes • Sketch and recognise nets of cuboids and other 3D shapes • Plans and elevations • Find area of 2D shapes • Calculate surface area of cubes and cuboids • Calculate surface area of triangular prisms • Calculate surface area of a cylinder • Calculate volume of cubes and cuboids • Calculate volume of other 3D shapes (prisms and cylinders) • **Explore volumes of cones, pyramids and spheres (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/468132626 https://vimeo.com/468462209 https://vimeo.com/471682224 https://vimeo.com/471682335 https://vimeo.com/471682402 https://vimeo.com/477506963 https://vimeo.com/477507427 https://vimeo.com/477512193
	Constructions and Congruency	• Draw and measure angles • Construct and interpret scale drawings • Construct the locus of distance from a point, straight line or shape, and equidistant from two points • Construct a perpendicular bisector • Construct a perpendicular from a point and to a point • Construct the locus of distance from two lines • Construct an angle bisector • Construct SSS, SAS, ASA triangles from given information • Identify congruent figures (determine congruency, even after transformations) • Explore and identify congruent triangles (SSS, SAS, ASA, AAS, RHS)	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/481595610 https://vimeo.com/481595638 https://vimeo.com/481595696 https://vimeo.com/481595698 https://vimeo.com/483971493 https://vimeo.com/483970980 https://vimeo.com/483971151 https://vimeo.com/483971293 https://vimeo.com/483971376 https://vimeo.com/485879759 https://vimeo.com/485879902 https://vimeo.com/485892119 https://vimeo.com/485880034

3	Numbers	• Understand the difference between integers, real and rational numbers • Work with directed number • Solve problems with integers • Solve problems with decimals • Finding HCF and LCM from a list • Express a number as its product of primes **& find HCF/LCM (H)** • Adding and subtracting fractions • Multiplying and dividing fractions • Solve problems with fractions • Converting between standard form and ordinary numbers • **Understand and simplify surds (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment **Autumn Term Assessment**	https://vimeo.com/490422808 https://vimeo.com/491143049 https://vimeo.com/490423618 https://vimeo.com/491143156 https://vimeo.com/491143193 https://vimeo.com/491143221 https://vimeo.com/491143221 https://vimeo.com/491143282 https://vimeo.com/491144638 https://vimeo.com/490424468 https://vimeo.com/491143317
	Using Percentages	• Equivalence of FDP (converting between FDP) • Calculating percentage increase and decrease (with and without calc) • Calculating percentage change (link to profit and loss) • Calculating a reverse percentage (finding the original amount) • Calculating reverse percentages using multipliers and calculator • Recognise and solve percentage problems (non-calculator) • Recognise and solve percentage problems (calculator) • **Solve problems with repeated percentage change (H) (compound multipliers useful here, links to compound interest in Maths and Money)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/499302126 https://vimeo.com/499302528 https://vimeo.com/499302899 https://vimeo.com/499303280 https://vimeo.com/499304236 https://vimeo.com/499303812 https://vimeo.com/499304687
	Maths and Money	• Solve problems with bills and bank statements (understand credit, debit and balance) • Calculate simple interest (calc and non-calc, finding interest or total value) • Calculate compound interest (understands the difference between linear and exponential growth – desmos useful here) • Solve problems with VAT (finding amount after VAT and finding original value) • Calculate wages and taxes (difference between wages and salary, overtime, time and a half, **tax brackets (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/502961994 https://vimeo.com/502718231 https://vimeo.com/502719868 https://vimeo.com/502721401 https://vimeo.com/505611700 https://vimeo.com/505612625 https://vimeo.com/505613243

		• Solve problems with exchange rates • Solve unit pricing problems (best buy/value for money – also in Ratio and Proportion)		
4	Deduction	• Angles in parallel lines (Include use of 3 letter notation) • Solving angles problems (using chains of reasoning) • Angles problems with algebra (using angle properties to form and solve equations) • Conjectures with angles (revisit statements of true/false, always/sometimes/never in the context of angles) • Conjectures with shapes (revisit statements of true/false, always/sometimes/never in the context of shapes) • **Link constructions and geometrical reasoning (H) (investigating the properties of shapes and the links to bisectors)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/509894521 https://vimeo.com/509894834 https://vimeo.com/509895143 https://vimeo.com/509895684 https://vimeo.com/515220729
	Rotation and Translation	• Identify the order of rotational symmetry of a shape (misconception around order of rotation 0 – no shape can have order of rotation 0) • Compare and contrast rotational symmetry with lines of symmetry (link back to missed y8 content, highlight lines and order of rotational symmetry not necessarily equal) • Rotate a shape about a point on a shape & not on a shape • Translate points and shapes by a given vector • Compare rotation and reflection of shapes	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/516749713 https://vimeo.com/516750060 https://vimeo.com/518615617 https://vimeo.com/516750304 https://vimeo.com/518618837 https://vimeo.com/518622283 https://vimeo.com/518615680
	Pythagoras' Theorem	• Squares and square roots • Identify the hypotenuse of a right-angled triangle • Determine whether a triangle is right-angled • Calculate the hypotenuse of a right-angled triangle • Calculate the missing short side in a right-angled triangle • Use Pythagoras on coordinate axis • Explore proofs of Pythagoras' theorem • **Use Pythagoras's theorem in 3D shapes (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/521971114 https://vimeo.com/521971544 https://vimeo.com/524881106 https://vimeo.com/524881840 https://vimeo.com/524882478 https://vimeo.com/524893478
5	Enlargement and Similarity	• Recognise enlargement and similarity	**Spring Assessment** Baseline assessment	https://vimeo.com/530692761

		• Enlarge a shape by a positive integer scale factor (consider lengths, perimeter and the effect of the scale factor) • Enlarge a shape by a positive integer scale factor from a point • Enlarge a shape by a positive fractional scale factor • Work out missing sides and angles in a pair of given similar shapes (students may spot answers intuitively so consider use of less obvious scale factors)	Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/530343385 https://vimeo.com/530343832 https://vimeo.com/530344238 https://vimeo.com/530344590 https://vimeo.com/530345022 https://vimeo.com/530345423 https://vimeo.com/530345978
	Solving Ratio and Proportion Problems	• Solve problems with direct proportion • Direct proportion and conversion graphs • Solve problems with inverse proportion • Solve ratio problems given the whole or a part • Solve best buy problems (links to 8. Maths and Money - unit pricing problems) • **Enlarge a shape by a negative scale factor (H)** • **Solve problems with similar triangles (H) (use of notation for lengths/angles)** • **Explore ratios in right-angled triangles (H) (using angles of 30 and 60, look at ratio of side lengths)** • **Graphs of inverse relationships (H)** • **Solve problems using ratio and algebra (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/538593641 https://vimeo.com/538594782 https://vimeo.com/538594402 https://vimeo.com/538598556 https://vimeo.com/539655119 https://vimeo.com/539667974 https://vimeo.com/539667310
	Rates	• Solve speed, distance, time problems without a calculator • Solve speed, distance, time problems with a calculator • Use distance-time graphs • Solve problems with density, mass and volume • Solve flow problems and their graphs • Rates of change and their units • **Convert compound units (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/542186166 https://vimeo.com/542187014 https://vimeo.com/542186927 https://vimeo.com/546553901 https://vimeo.com/546554579 https://vimeo.com/547453933
6	Probability	• Single event probability • Relative frequency • Expected outcomes • Independent events • Use diagrams to work out probabilities • **Use tree diagrams with replacement (H)** • **Use tree diagrams without replacement (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/548330041 https://vimeo.com/548330422 https://vimeo.com/548360948 https://vimeo.com/548330861 https://vimeo.com/548350382 https://vimeo.com/548331118 https://vimeo.com/548340966

	Algebraic Representation	• Draw and interpret quadratic graphs (knowing smooth curve, turning point and roots) • Interpret other graphs, including reciprocal (using a ruler to read values, discussing real-life applications e.g. distance-time) • Represent inequalities on an axis (dotted/solid lines, link to open closed circles on number line – shade regions) • **Investigate graphs of simultaneous equations (H)**	Baseline assessment Mini white board assessment Fortnightly mini assessment of content covered. Weekly Sparx homework on content covered with feedback. End of block summative assessment	https://vimeo.com/559356351 https://vimeo.com/559357256 https://vimeo.com/559357485 https://vimeo.com/559357637