SUBJECT: MATHEMATICS – Advanced +

Year Group	**Year 8**					
Rationale	Develop confidence and fluency with numerical and algebraic techniques and problem solving. To use a scientific calculator effectively. To develop further geometrical skills and techniques that support problem solving.					
	Autumn Term 1	**Autumn Term 2**	**Spring Term 1**	**Spring Term 2**	**Summer Term 1**	**Summer Term 2**
Topic/Unit	▪ Reverse Percentages & Multipliers ▪ Index Laws & Further Factorising ▪ Quadratic Sequences	▪ Probability ▪ Polygons, Angles & Parallel Lines ▪ Indices, Roots & Order of Operations	▪ Circles ▪ Representing & Solving Inequalities ▪ Pythagoras' Theorem	▪ Ratio & Proportion ▪ Linear Graphs & Co-ordinate geometry ▪ Quadratic & Cubic Graphs	▪ Scatter Graphs ▪ 3D Shapes	▪ Reciprocal & Circle Graphs ▪ Similarity in 2D
Knowledge	**Reverse Percentages & Multipliers** Pupils will know how to use a multiplier to find a percentage of an amount and how to increase/decrease by a percentage. Pupils will learn how to find what the original amount was before a percentage change has occurred. **Index Laws & Further Factorising** Pupils will know how to use the laws of indices when multiplying or dividing, when raising brackets to indices, when using fractional and negative indices and about the power 0. Pupils will be able to factorise a quadratic expression. Pupils will develop how to simplify algebraic fractions by first factorising. **Quadratic Sequences** Pupils will be introduced to quadratic sequences and learn how to	**Probability** Pupils will know how to write probabilities using fractions, percentages or decimals. Pupils will use the fact that the sum of all mutually exclusive events is 1, to solve a range of problems. Pupils will develop their estimation skills in working out the number of times an event will happen from given information and find the probability of successive events. Pupils will be able to list the outcomes from events, draw sample space diagrams & two-way tables to calculate conditional and unconditional probability. **Polygons, Angles & Parallel Lines** Pupils will be able to classify triangles and quadrilaterals from their geometric properties. Pupils will know how to find missing angles from triangles, quadrilaterals and more complex shapes. Pupil will know how to use the angle properties of parallel lines to find missing angles and give reasoning for their solutions.	**Circles** Pupils will be able to define the properties of a circle. Pupils will learn the formulas for area and circumference of circles. Pupils will learn how to find the area and/or perimeter of partial circles and composite shapes. Pupils will be able to find the radius or diameter when given the area or circumference. **Representing & Solving Inequalities** Pupils will be able to show inequalities on number lines using open and closed circles, list all integers that satisfy a given inequality and solve linear inequalities in one variable, in a range of situations. **Pythagoras' Theorem** Pupils will know how to use Pythagoras' theorem to find missing lengths in	**Ratio & Proportion** Pupils will know how to write ratios from given information and how to simplify ratios including the use of unitary form. Pupils will learn how to use a ratio to find one quantity when the other is known and change between fractions and ratios. Pupils will be able to divide a quantity into a given ratio and write a ratio as a linear function. Pupils will know how to change between scale model and real-life measurements, how to change between currencies, manipulate recipes in a range of contexts and justify which product offers the best value for money. **Linear Graphs & Coordinate Geometry** Pupils will know how to plot and draw graphs of the form ax + by = c and will be able to identify and interpret gradient and y-intercept.	**Scatter Graphs** Pupils will be able to draw axes and plot a scatter graph. Pupils will know the difference between positive, negative and no correlation and be able to interpret a scatter graph in terms of the relationship between the two variables. Pupils will know how to draw a line of best fit and use it to make predictions, understanding the difference in reliability in interpolation and extrapolation. Pupils will develop an understanding that correlation does not imply causality. Pupils will know how to identify outliers and consider what they mean. **3D Shapes** Pupils will be able to identify and sketch 3D shapes and develop an understanding about the planes of symmetry on 3D shapes. Pupils will know how to draw plans, front and side elevations	**Reciprocal & Circle Graphs** Pupils will know how to recognise linear, quadratic, cubic, reciprocal or circle graphs from their shape. Pupils will learn how to draw circle and reciprocal graphs from a table of values. Pupils will be able to state the value of x for which the equation is not defined for a reciprocal graph. **Similarity in 2D** Pupils will learn how to write the lengths of two shapes as a ratio in its simplest form. Pupils will develop their understanding of the conditions that make shapes similar. Pupils will be able to prove that two shapes are similar using angle properties. Pupils will be able to identify the scale factor that

	continue a quadratic sequence, derive the nth term and find a further terms in the sequence. Pupils will know how to use the nth term to generate a sequence and to deduce whether a specific number appears in a sequence.	**Indices, Roots & Order of Operations** Pupils will recognise powers of 2, 3, 4, 5 and 10 and use the equivalence in base numbers to solve problems. Pupils will be able to estimate square or cube roots and use index notation including negative powers. Pupil will learn how to solve order of operations (BIDMAS) questions and be able to use a calculator correctly to evaluate with indices and roots.	given right angle triangles. Pupils will be able to justify whether a triangle is right-angled using Pythagoras' theorem. Pupils will learn how to calculate the length of line segments when given their start and end coordinates.	Pupils will be able to find the equation of a line through one point with a given gradient and use the knowledge that parallel graphs have the same gradient. **Quadratic & Cubic Graphs** Pupils will know how to complete a table of values to generate coordinates to represent quadratic and cubic graphs and then plot quadratic and cubic graphs accurately. Pupils will be able to read from graphs to find approximate solutions to equations. Pupils will learn how to estimate the gradient at a point, on a quadratic or cubic graph and how to estimate the area under a quadratic graph.	for different 3D shapes and when given the front, side or plan elevation, be able to draw the 3D shape.	links similar shapes and then use it to find missing lengths.
Skills	**Reverse Percentages & Multipliers** Use a multiplier to find a percentage of an amount and to increase or decrease by a percentage (including decimal percentages and those greater than 100%) Find the original amount after a percentage increase or decrease. **Index Laws & Further Factorising** Use the laws of indices when multiplying or dividing with algebraic terms. Use index laws involving	**Probability** Write probabilities using fractions, percentages or decimals. Know and use the fact that the sum of all mutually exclusive events is 1, to solve a range of problems. Estimate the number of times an event will happen from given information and relative frequency. Find the probability of successive events. List all outcomes from single and combined events. Draw and use sample space diagrams. Draw and use two-way tables to calculate conditional and unconditional probability.	**Circles** Identify, define and draw parts of a circle. Use the formulae for circumference and area of a circle, giving decimal answers. Find the area and/or perimeter of partial circles and composite shapes. Find the radius or diameter when given the area of circumference. **Representing & Solving** Inequalities Show inequalities on number lines using open	**Ratio & Proportion** Write ratios from a range of given information. Simplify ratios including the use of unitary form. Divide a quantity in a given ratio. Use a ratio to find one quantity when the other is known. Interchange between fractions and ratios. Write a ratio as a linear function. Compare scale models to real life measure-ments, including to make estimates. Convert between currencies in a	**Scatter Graphs** Set up axes and plot a scatter graph. Identify outliers and consider what they show. Distinguish between positive, negative and zero correlation. Interpret a scatter graph in terms of the relationship of the two variables, using correlation and a real-life context. Draw a line of best fit, by eye, in order to support correlation. Find the equation of the line of best fit. Understand that correlation does	**Reciprocal & Circle Graphs** Recognise a linear, quadratic, cubic, reciprocal or circle graph from its shape. Draw circles with a centre at the origin, in the form $x^2 + y^2 = r^2$ Draw graphs of the reciprocal function $y = {}^{1}/_{x}$ with $x \neq 0$, using a table of values. For reciprocal graphs be able to state the value of x for which the equation is not defined.

	brackets (raising a power to a power) and the power 0. Use index laws including fractional and negative powers. Factorise a quadratic expression by grouping in pairs. Factorise a quadratic where the 'a' term is 1 or is prime. Factorise a quadratic using the difference of two squares. Simplify algebraic fractions by first factorising. **Quadratic Sequences** term of a quadratic sequence of the form an^2 or n^2 + c. Continue a quadratic sequence or find a specific term, including by using the nth term. Use the nth term to generate a sequence and to deduce whether a specific number appears in a given sequence.	**Polygons, Angles & Parallel Lines** Classify triangles and quadrilaterals from a range of geometric properties. Find missing angles in different triangles and quadrilaterals as well as more complex composite shapes/ diagrams. Use the angle properties of parallel lines to find missing angles (alternate, corresponding, co-interior) giving clear reasoning. Identify and use vertically opposite angles. **Indices, Roots & Order of Operations** Use index notation including negative powers. Recognise powers of 2, 3, 4, 5 and 10. Estimate square or cube roots using knowledge of square and cube numbers. Recognise and use the equivalence in base numbers in order to solve problems. Use BIDMAS correctly, including appreciating the use of negatives. Use a calculator correctly to evaluate with indices and roots.	and closed circles. Write down all integers that satisfy a given inequality. Solve linear inequalities in one variable, in a range of situations including 'double inequalities' such as 10 > 2x > 20. **Pythagoras' Theorem** Understand and use Pythagoras' theorem to find missing lengths in given right angle triangles – for a hypotenuse and other shorter side. Justify whether a triangle is right-angled using Pythagoras' theorem. Calculate the length of line segments, given their end coordinates. Manipulate other shapes in order to use Pythagoras' theorem.	range of contexts. Manipulate recipes in a range of contexts. Solve proportion problems using the unitary method. Work out and justify which product offers the best value for money. **Linear Graphs & Coordinate Geometry** Plot and draw graphs of the form ax + by = c. Identify and interpret gradient and intercept from graphs of the form ax + by = c. Find the equation of a line through one point with a given gradient. Know and use the fact that parallel graphs have the same gradient. **Quadratic & Cubic Graphs** Use tables of values to generate sets of coordinates to represent quadratic and cubic graphs. Plot and construct quadratic and cubic graphs accurately. Read from graphs to find approximate solutions to quadratic and cubic equations. Estimate the gradient at a point, on a quadratic or cubic graph. Estimate the area under a quadratic graph by dividing it into trapezia.	not imply causality. Use a line of best fit to make predictions, understanding the difference in reliability in interpolation and extrapolation. **3D Shapes** Sketch and identify 3D shapes. Sketch and identify places of symmetry on a range of 3D shapes. Draw plans, front elevations and side elevations of different 3D shapes. Given the front elevation, side elevation and plan be able to draw the 3D shape.	**Similarity in 2D** Write the lengths of two shapes as a ratio in its simplest form. Understand the conditions that make shapes similar, for both lengths and angles. Prove that two shapes are similar using angle properties and/or enlargement. Identify the scale factor that links similar shapes and use it to find missing lengths in a range of simple and more complex situations (including the use of fractional scale factors)

Assessments: Formative	Assessment 4 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 5 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 6 Assessment 7 Both Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.
Assessments: Summative			Assessment Window 1 will contain questions designed to assess students learning of the topics taught in the first term.		End-of-Year assessment designed to assess the students learning of all topics taught across the previous terms.	
Homework	Mathswatch: Assessment 4 Advanced+ revision assignment Independent homework tasks based on class teacher professional judgement	Assessment 5 Advanced+ revision assignment Core skills homework booklets Independent homework tasks.	Preparation for Assessment Window 1 including Mathswatch revision task. Independent homework tasks	Mathswatch: Assessment 6 Advanced+ revision assignment Mathswatch: Assessment 7 advanced+ revision assignment. Independent homework tasks	Preparation for end-of-year assessment weeks including Mathswatch revision task. Core skills homework booklets.	Independent homework tasks based on class teacher professional judgement

SUBJECT: MATHEMATICS – Advanced

Year Group	**Year 8**					
Rationale	Develop further confidence and fluency with numerical and algebraic techniques and problem solving. To use a scientific calculator effectively. To develop further geometrical skills and techniques that support problem solving.					
	Autumn Term 1	**Autumn Term 2**	**Spring Term 1**	**Spring Term 2**	**Summer Term 1**	**Summer Term 2**
Topic/Unit	▪ Percentages & Multipliers ▪ Index Laws & Further Factorising ▪ Quadratic Sequences	▪ Probability ▪ Polygons & Angles ▪ Indices, Roots & Order of Operations	▪ Circles ▪ Representing & Solving Inequalities ▪ Pythagoras' Theorem	▪ Ratio & Proportion ▪ Linear Graphs & Coordinate Geometry ▪ Quadratic & Cubic Graphs	▪ Scatter Graphs ▪ 3D Shapes and reflections/rotations	▪ Similarity in 2D ▪ Working with Grouped Data
Knowledge	**Reverse Percentages & Multipliers** Pupils will know how to use a multiplier to find a percentage of an amount and to increase or decrease by a percentage. Pupils will learn how to find the original amount after a percentage increase or decrease. **Index Laws & Further Factorising** Pupils will know how to use the laws of indices when multiplying or dividing, when raising brackets to indices and when using fractional indices, negative indices and the power 0. Pupils will be able to factorise a quadratic expression. Pupils will develop how to simplify algebraic fractions by first factorising. **Quadratic Sequences** Pupils will be introduced to quadratic sequences and learn how to	**Probability** Pupils will know to how to write probabilities using fractions, percentages or decimals. Pupils will use the fact that the sum of all mutually exclusive events is 1, to solve a range of problems. Pupils will develop their estimation skills in working out the number of times an event will happen and find the probability of successive events. Pupils will be able to list all the outcomes from events, draw sample space diagrams & two-way tables and use them to calculate conditional and unconditional probability. **Polygons, Angles & Parallel Lines** Pupils will be able to classify triangles and quadrilaterals from their geometric properties. Pupils will know how to find missing angles from triangles,	**Circles** Pupils will be able to define the properties of a circle. Pupils will know the formulas for area and circumference of circles. Pupils will learn how to find the area and/or perimeter of partial circles and composite shapes. Pupils will be able to find the radius or diameter when given the area or circumference. **Representing & Solving Inequalities** Pupils will be able to show inequalities on number lines using open and closed circles, list all integers that satisfy a given inequality and solve linear inequalities in one variable, in a range of situations. **Pythagoras' Theorem** Pupils will know how to use Pythagoras' theorem to find	**Ratio & Proportion** Pupils will know how to write ratios from given information and how to simplify ratios including the use of unitary form. Pupils will learn how to use a ratio to find one quantity when the other is known and change between fractions and ratios. Pupils will be able to divide a quantity into a given ratio and write a ratio as a linear function. Pupils will know how to change between scale model and real-life measurements, change between currencies, manipulate recipes and justify which product offers the best value for money. **Linear Graphs & Coordinate Geometry** Pupils will know how to plot and draw graphs of the form ax + by = c and will be able to identify and interpret gradient and y-intercept.	**Scatter Graphs** Pupils will be able to draw axes and plot a scatter graph. Pupils will know the difference between positive, negative and no correlation and be able to interpret a scatter graph in terms of the relationship between the two variables. Pupils will know how to draw a line of best fit and use it to make predictions, understanding the difference in reliability in interpolation and extrapolation. Pupils will develop an understanding that correlation does not imply causality. Pupils will know how to identify outliers and consider what they mean. **3D Shapes & Reflections/ Rotations** Pupils will be able to identify and sketch 3D shapes and identify planes of symmetry on 3D shapes. Pupils will know how to draw	**Similarity in 2D** Pupils will learn how to write the lengths of two shapes as a ratio in its simplest form. Pupils will develop their understanding of the conditions that make shapes similar. Pupils will be able to prove that two shapes are similar using angle properties and/or enlargement. Pupils will be able to identify the scale factor that links similar shapes and then use it to find missing lengths. **Working with Grouped Data** Pupils will be able to find the modal class interval from continuous grouped frequency data, find the class interval that contains the median and find an estimate for the mean. Pupils will understand why the mean is only an estimate.

	continue a sequence, derive the nth term of a quadratic sequence and find a specific term in the sequence. Pupils will know how to use the nth term to generate a sequence and to deduce whether a specific number appears in a sequence.	quadrilaterals and more complex shapes. Pupil will know how to use angle properties including parallel lines to find missing angles and give reasoning for their solutions. **Indices, Roots & Order of Operations** Pupils will recognise powers of 2, 3, 4, 5 and 10 and use the equivalence in base numbers to solve problems. Pupils will be able to estimate square or cube roots and use index notation including negative powers. Pupil will learn how to solve order of operations questions. Pupils will be able to use a calculator correctly to evaluate with indices and roots.	missing lengths in right angle triangles. Pupils will be able to justify whether a triangle is right-angled using Pythagoras' theorem. Pupils will learn how to calculate the length of line segments when given their start and end coordinates.	Pupils will be able to find the equation of a line through one point with a given gradient and use the knowledge that parallel graphs have the same gradient. **Quadratic & Cubic Graphs** Pupils will know how to complete a table of values to generate coordinates to plot quadratic and cubic graphs accurately. Pupils will be able to read from graphs to find approximate solutions to quadratic and cubic equations. Pupils will learn how to estimate the gradient at a point on a quadratic or cubic graph and how to estimate the area under a quadratic graph..	plan, front and side elevations for different 3D shapes and when given the front, side or plan elevation, be able to draw the 3D shape. Pupils will know how to reflect 2D shapes over mirror lines and including those drawn on axes or named equations of lines. Pupils will learn how to describe reflections using correct wording. Pupils will know how to rotate 2D shapes using the origin or any other point on a coordinate grid.	

Skills	**Percentages & Multipliers** Use a multiplier to find a percentage of an amount and to increase or decrease by a percentage (including decimal percentages and those greater than 100%) **Index Laws & Further Factorising** Use the laws of indices when multiplying or dividing with algebraic terms. Use index laws involving brackets (raising a power to a power) and the power 0. Use index laws including simple fractional and negative powers. Factorise a quadratic expression of the form $x^2 + bx + c$ where b and c are positive and negative. Factorise a quadratic expression by grouping in pairs. Factorise a quadratic where the 'a' term is 1 or is prime. Factorise a quadratic using the difference of two squares. Simplify algebraic fractions by first factorising (simple quadratics of the form $x^2 + bx + c$ or $ax^2 + bx + c$ where 'a' is prime). **Quadratic Sequences** Find the nth term of a quadratic sequence of the form an^2 or $n^2 + c$.	**Probability** Write probabilities using fractions, percentages or decimals. Know and use the fact that the sum of all mutually exclusive events is 1, to solve a range of problems. Find the probability of successive events. List all outcomes from single and combined events. Draw and use sample space diagrams. Draw and use two-way tables to calculate conditional and unconditional probability. **Polygons & Angles** Classify triangles and quadrilaterals from a range of geometric properties. Find missing angles in different triangles and quadrilaterals as well as more complex compo-site shapes/ diagrams. **Indices, Roots & Order of Operations** Use index notation including negative powers. Recognise powers of 2, 3, 4, 5 and 10. Estimate square or cube roots using knowledge of square and cube numbers. Recognise and use the equivalence in base numbers in order to solve	**Circles** Identify, define and draw parts of a circle. Use the formulae for circumference and area of a circle, giving decimal or 'in terms of pi' answers. Find the radius or diameter when given the area of circumference. **Representing & Solving Inequalities** Show inequalities on number lines using open and closed circles. Write down all integers that satisfy a given inequality. Solve linear inequalities in one variable, in a range of situations including 'double inequalities' such as $10 > 2x > 20$. **Pythagoras' Theorem** Understand and use Pythagoras' theorem to find missing lengths in given right angle triangles – for a hypotenuse and other shorter side. Justify whether a triangle is right-angled using Pythagoras' theorem. Calculate the length of line segments, given their end coordinates. Manipulate other shapes in order to use Pythagoras' theorem.	**Ratio & Proportion** Write ratios from a range of given information. Simplify ratios including the use of unitary form. Divide a quantity in a given ratio. Use a ratio to find one quantity when the other is known. Interchange between fractions and ratios. Compare scale models to real life measure-ments, including to make estimates. Convert between currencies in a range of contexts. Manipulate recipes in a range of contexts. Solve proportion problems using the unitary method. Work out and justify which product offers the best value for money. **Linear Graphs & Coordinate Geometry** Know and use the fact that parallel graphs have the same gradient. Find the equation of a straight line from a graph given in the form $y = mx + c$. Sketch a linear graph using the gradient and y-intercept. Find approximate solutions to a linear equation from its graph. **Quadratic & Cubic Graphs** Use tables of values to generate sets of	**Scatter Graphs** Set up axes and plot a scatter graph. Identify outliers and consider what they show. Distinguish between positive, negative and zero correlation. Interpret a scatter graph in terms of the relationship of the two variables, using correlation and a real-life context. Draw a line of best fit, by eye, in order to support correlation. Find the equation of the line of best fit. Understand that correlation does not imply causality. Use a line of best fit to make predictions, understanding the difference in reliability in interpolation and extrapolation. **3D Shapes and reflections/rotations** Sketch and identify 3D shapes. Sketch and identify places of symmetry on a range of 3D shapes. Draw plans, front elevations and side elevations of different 3D shapes. Given the front elevation, side elevation and plan be able to draw the 3D shape. Reflect 2D shapes using mirror lines. Transformations reflections over x axis y axis $y = x$, $y = -x$, $y = a$, $x = b$ and describing.	**Similarity in 2D** Write the lengths of two shapes as a ratio in its simplest form. Understand the conditions that make shapes similar, for both lengths and angles. Prove that two shapes are similar using angle properties and/or enlargement. Identify the scale factor that links similar shapes and use it to find missing lengths in a range of simple and more complex situations (including the use of fractional scale factors) **Working with Grouped Data** Find the modal class interval from a grouped frequency data containing continuous data. Find the class interval that contains the median, from a grouped frequency data containing continuous data. Find an estimate for the mean from a grouped frequency data containing continuous data. Understand why the mean is only an estimate.

	Continue a quadratic sequence or find a specific term, including by using the nth term. Use the nth term to generate a sequence and to deduce whether a specific number appears in a given sequence.	simple problems. Use BIDMAS correctly, including. appreciating the use of negatives. Use a calculator correctly to evaluate with indices and roots.		coordinates to represent quadratic and cubic graphs. Plot and construct quadratic and cubic graphs accurately. Read from graphs to find approximate solutions to quadratic and cubic equations. Estimate the area under a quadratic graph by dividing it into trapezia.	Rotate 2D shapes using the origin or any other point on a coordinate grid.	
Assessments Formative	Assessment 4 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 5 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 6 Assessment 7 Both open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.
Assessments Summative			Assessment Window 1 will contain questions designed to assess students learning of the topics taught in		End-of-Year assessment designed to assess the students learning of all topics taught across the previous terms.	
Homework	Mathswatch: Assessment 4 Advanced revision task Independent homework tasks based on class teacher professional judgement	Mathswatch: Assessment 5 Advanced revision task Core skills homework booklets Independent homework tasks based on class teacher professional judgement	Preparation for Assessment Window1 including Mathswatch revision task. Independent homework	Mathswatch: Assessment 6 Advanced revision task. Independent homework tasks Mathswatch: Assessment 7 Advanced revision task	Preparation for end-of-year assessment Weeks including Mathswatch revision task. Core skills homework booklets	Independent homework tasks based on class teacher professional judgement.

SUBJECT: MATHEMATICS: Core+

Year Group	**Year 8**					
Rationale	Develop further confidence with algebraic and geometrical techniques to support problem solving. To use a scientific calculator more effectively. To increase fluency with the manipulation of proportional reasoning and number skills.					
	Autumn Term 1	**Autumn Term 2**	**Spring Term 1**	**Spring Term 2**	**Summer Term 1**	**Summer Term 2**
Topic/Unit	▪ Working with Percentages ▪ Working with Indices, Powers & Roots	▪ Theoretical Probability ▪ Lines, Shapes & Angles	▪ Circles ▪ Representing & Solving Inequalities ▪ Application of Fractions	▪ Ratio & Proportion ▪ Drawing Linear Graphs	▪ Relative Frequency & Listing Outcomes ▪ Scatter Graphs	▪ 2D & 3D Shapes ▪ Time
Knowledge	**Working with Percentages** Pupils will know how to find a percentage of a quantity using a decimal multiplier Pupils will be able to use percentages in real-life contexts including profit & loss, VAT, simple interest and income tax calculations. **Working with Indices, Powers & Roots** Pupils will be able to recognise powers of 2, 3, 4, 5 and 10 and list a range of square and cube numbers. Pupils will know how to use the laws of indices to multiply and divide numbers written in index notation. Pupils will learn how to evaluate expressions involving squares, cubes and roots using the arithmetic and index laws. Pupils will be able to use BIDMAS rules correctly and how to use a calculator when evaluating.	**Theoretical Probability** Pupils will know the definitions of key words - impossible, unlikely, evens, likely and certain. Pupils will be able to mark events on a probability scale and write probabilities in fractions, decimals and percentages. Pupils will know how to find the probability of an event occurring and work out probabilities from frequency tables. Pupils will develop their knowledge of mutually exclusive events to the probability of an event not happening. Pupils will be able to list outcomes for events. **Lines, Shapes & Angles** Pupils will know how to use correct letter notation for lines, angles and shapes. Pupils will be able to identify parallel and perpendicular lines and describe measures of turn using	**Circles** Pupils will be able to identify and draw parts of a circle and use the formulae for circumference and area of a circle, giving answers in decimal or 'in terms of pi'. **Representing & Solving Inequalities** Pupils will know how to show inequalities on number lines using open and closed circles and list all integers that satisfy a given inequality. Pupils will be able to solve simple linear inequalities in one variable and represent the solution on a number line. **Application of Fractions** Pupils will know how to add, subtract, multiply and divide fractions and mixed numbers. Pupils will be able to find the reciprocal of an integer, decimal or fraction.	**Ratio & Proportion** Pupils will know how to simplify ratios and write ratios in unitary form. Pupils will be able to express the division of a quantity in a ratio. Pupils will now how to use a ratio to find one quantity when the other is known and change between fractions and ratios. Pupils will be able to convert between scale models and real-life measurements, change between currencies, manipulate recipes, work out and justify which product offers the best value and solve other proportion problems using the unitary method. **Drawing Linear Graphs** Pupils will know how to identify and draw graphs parallel to the axes. Pupils will be able to plot and draw graphs in the form y = mx + c. Pupils will learn how to identify and interpret the gradient of a	**Relative Frequency & Listing Outcomes** Pupils will know how to find the probability of an event using relative frequency, estimate the number of times an event will occur given the probability and the number of trials, compare experimental and theoretical probabilities, list outcomes systematically and draw/use sample space diagrams. **Scatter Graphs** Pupils will know how to draw axes and plot a scatter graph. Pupils will be able to tell the difference between positive, negative and no correlation and be able to interpret a scatter graph in terms of the relationship of the two variables. Pupils will be able to draw a line of best fit and use it to make predictions. Pupils will understand that correlation does not imply causality and	**2D & 3D Shapes** Pupils will be able to draw circles and arcs to a given radius or diameter, measure and draw line to the nearest mm and know the compass directions. Pupils will identify and make accurate drawing of 2D and 3D shapes. shapes. Pupils will be able to count the number of faces, edges and vertices and identify planes of symmetry on 3D shapes. Pupils will be able to draw plans, front and side elevations and be able to draw the 3D shape when given the front, side and plan elevations. **Time** Pupils will know how to use notation for 12- and 24-hour clock times and be able to convert between the two. Pupils will learn how to work out the time taken for a journey and calculate time intervals in hours & minutes.

		angles and directions. Pupils will be able to estimate angle sizes and then measure accurately. Pupils will develop their understanding of the angle properties of triangles, straight lines, quadrilaterals and vertically opposite angles. Pupils will know how to identify different types of angles, triangles and quadrilaterals.		graph given in the form y = mx + c.	the difference in reliability in interpolation and extrapolation. Pupils will be able to identify outliers and consider what they mean.	Pupils will develop an understanding of how to use a calculator correctly with time calculations.
Skills	**Working with Percentages** Find a percentage of a quantity using a decimal multiplier Use percentages in real-life contexts including price after VAT, value of profit and loss, simple interest and income tax calculations. **Working with Indices, Powers & Roots** Use index notation including negative powers. Recognise powers of 2, 3, 4, 5 and 10. Recall the squares of 1 to 20 and cubes of 1, 2, 3, 4, 5 and 10. Use the laws of indices to multiply and divide numbers written in index notation. Evaluate expressions involving squares, cubes and roots using the four rules of	**Theoretical Probability** Distinguish events as impossible, unlikely, evens, likely and certain. Mark events on a probability scale. Write probabilities in words, fractions, decimals and percentages. Find the probability of an event occurring. List outcomes for single events. Work out probabilities from frequency tables. Use knowledge of mutually exclusive events to calculate missing probabilities or the probability of an event not happening. **Lines, Shapes & Angles** Use correct 3 or 2 letter notation for lines, angles and shapes. Identify and mark parallel and perpendicular lines.	**Circles** Identify, define and draw parts of a circle. Use the formulae for circumference and area of a circle, giving decimal or 'in terms of pi' answers. **Representing & Solving Inequalities** Show inequalities on number lines using open and closed circles. Write down all integers that satisfy a given inequality. Solve simple linear inequalities in one variable, and represent the solution on a number line. **Application of Fractions** Add, subtract, multiply and divide fractions and mixed numbers in a range of different contexts. Find the reciprocal of an integer,	**Ratio & Proportion** Express the division of a quantity in a ratio. Simplify ratios including writing ratios in unitary form. Share a quantity in a given ratio including 3 part ratios. Use a ratio to find one quantity when the other is known. Interchange between fractions and ratios. Compare scale models to real life measurements, including to make estimates. Convert between currencies in a range of contexts. Manipulate recipes in a range of contexts. Solve proportion problems using the unitary method. Work out and justify which product offers the best value for money.	**Relative Frequency & Listing Outcomes** Find the probability of an event using relative frequency. Estimate the number of times an event will occur given the probability and the number of trials. Compare experimental and theoretical probabilities. List outcomes systematically for combined events. Draw and use sample space diagrams. **Scatter Graphs** Set up axes and plot a scatter graph. Identify outliers and consider what they show. Distinguish between positive, negative and zero correlation. Interpret a scatter graph in terms of the relationship of the two variables, using correlation and a real-life context.	**2D & 3D Shapes** Pupils will be able to draw circles and arcs to a given radius or diameter, measure/draw lines to the nearest mm and know the compass directions. Pupils will identify and make accurate drawing of 2D and 3D shapes. shapes. Pupils will be able to count the number of faces, edges and vertices and identify planes of symmetry on 3D shapes. Pupils will be able to draw plans, front and side elevations and be able to draw the 3D shape when given the front, side and plan elevations. **Time** Pupils will know how to use correct notation for 12 and 24-hour clock and how to convert between the two. Pupils will be able to work

	arithmetic and index laws. Use BIDMAS correctly, including appreciating the use of negatives. Use a calculator correctly to evaluate with indices and roots.	Describe measures of turn using angles, including clockwise and anti-clockwise. Estimate angle sizes. Measure angles accurately using a protractor. Identify, draw and describe angle types, different triangles and different quadrilaterals. Understand and use the angle properties of triangles, straight lines, quadrilaterals and vertically opposite angles.	decimal or fraction.	**Drawing Linear Graphs** Draw and identify graphs parallel to the axes as well as y = x and y = -x. Plot and draw graphs in the form y = mx + c with and without a given table of values. Identify and interpret the gradient of a graph given in the form y = mx + c. Sketch a graph using the gradient and intercept.	Draw a line of best fit by eye, in order to support correlation. Understand that correlation does not imply causality. Use a line of best fit to make predictions, understanding the difference in reliability in interpolation and extrapolation.	out the time taken for a journey. Calculate time intervals in hours, minutes or a mixture of both. Use a calculator correctly with time calculations.
Assessments Formative	Assessment 4 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 5 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 6 Assessment 7 Both open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.
Assessments Summative			Assessment Window 1 will contain questions designed to assess students learning of the topics taught in the first term.		End-of-Year assessment designed to assess the students learning of all topics taught across the previous terms	
Homework	Mathswatch: Assessment 4 Advanced revision task Independent homework tasks based on class teacher professional judgement	Mathswatch: Assessment 5 Advanced revision task Core skills homework booklets Independent homework tasks	Preparation for Assessment Window1 including Mathswatch revision task. Independent homework tasks	Mathswatch: Assessment 6 Advanced revision task. Independent homework tasks Mathswatch: Assessment 7 Advanced revision task	Preparation for end-of-year assessment Weeks including Mathswatch revision task. Core skills homework booklets	Independent homework tasks based on class teacher professional judgement.

SUBJECT: MATHEMATICS: Core Pathway

Year Group	**Year 8**					
Rationale	Develop confidence with geometrical techniques to support problem solving. To use a scientific calculator more effectively. To increase confidence with the manipulation of proportional reasoning and number skills.					
	Autumn Term 1	**Autumn Term 2**	**Spring Term 1**	**Spring Term 2**	**Summer Term 1**	**Summer Term 2**
Topic/Unit	▪ Working with Percentages ▪ Working with Indices, Powers & Roots	▪ Theoretical Probability ▪ Lines, Shapes & Angles ▪ Perimeter & Area Revisit	▪ Representing & Solving Inequalities ▪ Ratio & Proportion	▪ Fractions Revisit ▪ Drawing Linear Graphs	▪ Relative Frequency & Listing Outcomes ▪ Scatter Graphs	▪ 2D & 3D Shapes ▪ Time
Knowledge	**Working with Percentages** Pupils will know how to find a percentage of a quantity using a decimal multiplier Pupils will be able to use percentages to solve problems based on profit & loss, VAT, simple interest and income tax calculations. **Working with Indices, Powers & Roots** Pupils will be able to recognise powers of 2, 3, 4, 5 and 10 and list a range of square and cube numbers. Pupils will know how to use the laws of indices to multiply and divide numbers written in index notation. Pupils will learn how to evaluate expressions involving squares, cubes and roots using the arithmetic and index laws. Pupils will be able to use BIDMAS rules correctly and how to use a calculator when evaluating.	**Theoretical Probability** Pupils will know the definitions of the key word impossible, unlikely, evens, likely and certain. Pupils will be able to mark events on a probability scale and write probabilities in words, fractions, decimals and percentages. Pupils will know how to find the probability of an event occurring and work out probabilities from frequency tables. Pupils will develop their knowledge of mutually exclusive events to calculate missing probabilities and the probability of an event not happening. Pupils will be able to list all outcomes for events happening. **Lines, Shapes & Angles** Pupils will know how to use correct letter notation for lines, angles and shapes. Pupils will be able to identify parallel and perpendicular lines and	**Representing & Solving Inequalities** Pupils will know how to show inequalities on number lines using open and closed circles and list all integers that satisfy a given inequality. Pupils will be able to solve simple linear inequalities in one variable and represent the solution on a number line. **Ratio & Proportion** Pupils will know how to simplify ratios including writing ratios in unitary form. Pupils will be able to express the division of a quantity in a ratio and share a quantity in a ratio. Pupils will know how to use a ratio to find one quantity when the other is known and change between fractions and ratios. Pupils will be able to convert between scale models and real-life	**Fractions Revisit** Pupils will know how to describe shaded parts of a diagram using fractions and use diagrams to compare fractions. Pupils will know how to express one value as a fraction of another and find fractions of amounts. Pupils will develop their knowledge of converting between mixed numbers and improper fractions. Pupils will be able to use the 4 rules of arithmetic with fractions. **Drawing Linear Graphs** Pupils will know how to identify and draw graphs parallel to the axes, be able to plot graphs in the form y = mx + c and develop their knowledge of identifying the gradient of a line. Pupils will learn how to sketch graphs using the gradient and Y-intercept.	**Relative Frequency & Listing Outcomes** Pupils will know how to find the probability of an event using relative frequency. Pupils will learn how to estimate the number of times an event will occur given the probability and the number of trials. Pupils will be able to compare experimental and theoretical probabilities, list outcomes systematically and draw/use sample space diagrams. **Scatter Graphs** Pupils will know how to draw axes and plot a scatter graph. Pupils will be able to tell the difference between positive, negative and no correlation and be able to interpret a scatter graph in terms of the relationship between the variables. Pupils will be able to draw a line of best fit and use it to make estimates. Pupils will be able to identify outliers and	**2D & 3D Shapes** Pupils will be able to draw circles and arcs to a given radius or diameter, measure and draw line to the nearest mm and know the compass directions. Pupils will identify and make accurate drawing of 2D and 3D shapes. shapes. Pupils will be able to count the number of faces, edges and vertices and identify planes of symmetry on 3D shapes. Pupils will be able to draw plans, front and side elevations and be able to draw the 3D shape when given the front, side and plan elevations. **Time** know how to use notation for 12- and 24-hour clock times and be able to convert between the two. Pupils will learn how to work out the time taken for a journey and calculate time intervals in hours & minutes. Pupils will develop an

		describe measures of turn using angles and directions. Pupils will be able to estimate angle sizes and then measure accurately. Pupils will develop their understanding of the angle properties of triangles, straight lines, quadrilaterals and vertically opposite angles. Pupils will know how to identify different types of triangles and quadrilaterals. . **Perimeter & Area Revisit** Pupils will know how to find the perimeter and area of 2D shapes including rectangles, triangles, parallelograms, trapezia and of composite shapes.	measurement, change between currencies, manipulate recipes, work out and justify which product offers the best value and solve other proportion problems using the unitary method.		consider what they mean.	understanding of how to use a calculator correctly with time calculations.
Skills	**Working with Percentages** Convert between simple fractions, decimals and percentages. Compare and order simple fractions, decimals and percentages. Express a number as a percentage of another number. Find a percentage of a quantity without a calculator: 50%, 25% and multiples of 10% and 5%. Find a percentage of a quantity with a calculator. Calculate the amount of percentage increase and decrease.	**Theoretical Probability** Distinguish events as impossible, unlikely, evens, likely and certain. Mark events on a probability scale. Write probabilities in words, fractions, decimals and percentages. Find the probability of an event occurring. List outcomes for single events. Work out probabilities from frequency tables. Work out probabilities from given two-way tables. Use knowledge of mutually exclusive events	**Representing & Solving Inequalities** Show inequalities on number lines using open and closed circles. Write down all integers that satisfy a given inequality. Solve simple linear inequalities in one variable and represent the solution on a number line. **Ratio & Proportion** Write a ratio to describe a situation or to represent a division of parts. Simplify ratios including writing ratios in	**Fractions Revisit** Write fractions to describe shaded parts of a diagram and use diagrams to compare or order fractions. Simplify and find equivalent fractions including to compare or order fractions. Express one value as a fraction of another. Convert between mixed numbers and improper fractions. Add and subtract fractions including with mixed numbers. Multiply and divide fractions with fractions	**Relative Frequency & Listing Outcomes** Find the probability of an event using relative frequency. Estimate the number of times an event will occur given the probability and the number of trials. List outcomes systematically for combined events. Draw and use simple sample space diagrams. **Scatter Graphs** Plot or complete a scatter graph on given axes. Identify outliers and consider what they show. Distinguish between	**2D & 3D Shapes** Draw circles and arcs to a given radius or diameter. Measure and draw line to the nearest mm. Know and use compass directions. Make accurate drawings of triangles using a ruler and protractor. Sketch and identify 3D shapes. Find the number of faces, edges and vertices on a 3D shape. Sketch and identify places of symmetry on simple 3D shapes. Draw plans, front elevations and side elevations of

	Use percentages in simple real-life contexts including price after VAT. **Working with Indices, Powers & Roots** Recall the squares of 1 to 10 and cubes of 1, 2, 3, 4, 5 and 10. Recognise powers of 2, 3, 4, 5 and 10. Evaluate expressions involving squares, cubes and roots using the four rules of arithmetic and index laws. Use index notation for powers of 10, including negative powers. Use the laws of indices to multiply and divide numbers written in index notation. Use BIDMAS correctly, including appreciating the use of negatives. Use a calculator correctly to evaluate with indices and roots.	to calculate missing probabilities or the probability of an event not happening in simple examples. **Lines, Shapes & Angles** Use correct 3 or 2 letter notation for lines, angles and shapes. Identify and mark parallel and perpendicular lines. Describe measures of turn using angles, including clockwise and anti-clockwise. Estimate angle sizes. Measure angles accurately using a protractor. Identify, draw and describe angle types, different triangles and different quadrilaterals. Understand and use the angle properties of triangles, straight lines, quadrilaterals and vertically opposite angles. **Perimeter & Area Revisit** Find the perimeter of rectangles, triangles, parallelograms and trapezia. Find the perimeter of composite shapes made up from rectangles, triangles, parallelograms and trapezia. Find the area of rectangles and triangles using formulae. Find the area of composite shapes made from rectangles and triangles.	simple unitary form. Share a quantity in a given ratio including 3 part ratios. Interchange between fractions and ratios. Convert between currencies in a range of contexts. Manipulate recipes in a range of contexts. Solve proportion problems using the unitary method. Work out and justify which product offers the best value for money, in simple cases.	and with integers. Find a fraction of an amount. **Drawing Linear Graphs** Draw and identify graphs parallel to the axes as well as y = x and y = -x. Plot and draw graphs in the form y = mx + c with and without a given table of values. Recognise that graphs of the form y = mx + c correspond to straight lines.	positive, negative and zero correlation. Interpret a scatter graph in terms of the relationship of the two variables, using correlation and a real-life context, in more simple cases. Draw a line of best fit by eye, in order to support correlation. Use a line of best fit to make predictions, understanding the difference in reliability in interpolation and extrapolation (using more simple language).	simple 3D shapes. Given the front elevation, side elevation and plan be able to draw the 3D shape, in very simple cases. **Time** Use correct notation for 12 and 24-hour clock and convert between the two. Work out the time taken for a journey. Calculate time intervals in hours, minutes or a mixture of both. Use a calculator correctly with time calculations.

Assessments Formative	Assessment 4 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 5 Open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	Assessment 6 Assessment 7 Both open book End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.	End-of-topic quizzes. Regular use of whiteboards in lessons.
Assessments Summative			Assessment 1 will contain questions designed to assess students learning of the topics taught in the first term.		End-of-Year assessment designed to assess the students learning of all topics taught across the previous terms	
Homework	Mathswatch: Assessment 4 Advanced revision task Independent homework tasks based on class teacher professional judgement	Mathswatch: Assessment 5 Advanced revision task Core skills homework booklets Independent homework tasks	Preparation for Assessment Window1 including Mathswatch revision task. Independent homework tasks	Mathswatch: Assessment 6 Advanced revision task. Independent homework tasks Mathswatch: Assessment 7 Advanced revision task	Preparation for end-of-year assessment weeks including Mathswatch revision task. Core skills homework booklets	Independent homework tasks based on class teacher professional judgement.