Curriculum Mapping in the Department of Mathematics	
Year 10	**Year 11**

	Year 10	Year 11
Autumn 1	**Prior knowledge: Number skills** Use priority of operations with positive and negative numbers. Simplify calculations by cancelling. Use inverse operations. Round to a given number of decimal place. Multiply and divide decimal numbers. Write decimal numbers of millions. Round to a given number of significant figures. Estimate answers to calculations. Use one calculation to find the answer to another. Recognise 2-digit prime numbers. Find factors and multiples of numbers. Find common factors and common multiples of two numbers. Find the HCF and LCM of two numbers by listing. Find square roots and cube roots. Find square roots and cube roots. Recognise powers of 2, 3, 4 and 5. Understand surd notation on a calculator. Write a number as the product of its prime factors. Use prime factor decomposition and Venn diagrams to find the HCF and LCM. **Knowledge, skills and objectives:** **Ratio, probability and proportion** Understand mutually exclusive and exhaustive outcomes. Use two-way tables to record the outcomes from two events. Work out probabilities from sample space diagrams. Find and interpret probabilities based on experimental data. Make predictions from experimental data.	**Prior Knowledge: Ratio, Probability and proportion** Understand mutually exclusive and exhaustive outcomes. Use two-way tables to record the outcomes from two events. Work out probabilities from sample space diagrams. Find and interpret probabilities based on experimental data. Make predictions from experimental data. Use Venn diagrams to work out probabilities. Understand the language of sets and Venn diagrams**.** Write a ratio in its simplest form. Solve problems using ratios. Solve simple problems using ratios. Use ratios to convert between units. Write and use ratios for shapes and their enlargements. Divide a quantity into 2 parts in a given ratio. Divide a quantity into 3 parts in a given ratio. Solve word problems using ratios. Use ratios involving decimals. Compare ratios. Solve ratio and proportion problems. Use the unitary method to solve proportion problems. Solve proportion problems in words. Work out which product is better value for money **Knowledge, skills and objectives: Algebra and quadratic equations** Use correct algebraic notation. Write and simplify expressions. Use the index laws. Multiply and divide expressions. Substitute numbers into expressions. Recognise the difference between a formula and an expression.

	Use Venn diagrams to work out probabilities. Understand the language of sets and Venn diagrams. Write a ratio in its simplest form. Solve problems using ratios. Solve simple problems using ratios. Use ratios to convert between units. Write and use ratios for shapes and their enlargements. Divide a quantity into 2 parts in a given ratio. Divide a quantity into 3 parts in a given ratio. Solve word problems using ratios. Use ratios involving decimals. Compare ratios. Solve ratio and proportion problems. Use the unitary method to solve proportion problems. Solve proportion problems in words. Work out which product is better value for money.	Substitute numbers into a simple formula. Expand brackets. Simplify expressions with brackets. Substitute numbers into expressions with brackets and powers. Recognise factors of algebraic terms. Multiply double brackets. Recognise quadratic expressions. Square single brackets. Plot graphs of quadratic functions. Recognise a quadratic function. Use quadratic graphs to solve problems
Cross curricular link	PSHE and RSE – knife and gang crime English- Functional skills style questions ICT and employability- money and career paths	PSHE and RSE – knife and gang crime English- Functional skills style questions ICT and employability- money and career paths
Autumn 2	**Prior knowledge: Statistics, averages, graphs and charts** Designing tables and data collection sheets. Reading data from tables. Use data from tables. Design and use two-way tables. Draw and interpret comparative and composite bar charts. Interpret and compare data shown in bar charts, line graphs and histograms. Plot and interpret time series graphs. Use trends to predict what might happen in the future. Construct and interpret stem and leaf and back-to-back stem and leaf diagrams. Draw and interpret pie charts.	**Prior Knowledge: Graphs and transformations** Find the midpoint of a line segment. Recognise, name and plot straight-line graphs parallel to the axes. Generate and plot coordinates from a rule. Plot straight-line graphs from tables of values. Draw graphs to represent relationships. Find the gradient of a line. Identify and interpret the gradient from an equation. Understand that parallel lines have the same gradient. Understand what m and c represent in $y = mx + c$. Find the equations of straight-line graphs. Draw and interpret graphs from real data. Use distance–time graphs to solve problems.

Plot and interpret scatter graphs.
Calculate the mean from a list and from a frequency table.
Compare sets of data using the mean and range.
Find the mode, median and range from a stem and leaf diagram.
Identify outliers.
Estimate the range from a grouped frequency table.
Recognise the advantages and disadvantages of each type of average.
Find the modal class.
Find the median from a frequency table.
Estimate the mean of grouped data.

Knowledge, skills and objectives:
Graphs and transformations
Find the midpoint of a line segment.
Recognise, name and plot straight-line graphs parallel to the axes.
Generate and plot coordinates from a rule.
Plot straight-line graphs from tables of values.
Draw graphs to represent relationships.
Find the gradient of a line.
Identify and interpret the gradient from an equation.
Understand that parallel lines have the same gradient.
Understand what m and c represent in y = mx + c.
Find the equations of straight-line graphs.
Draw and interpret graphs from real data.
Use distance–time graphs to solve problems.
Draw distance–time graphs.
Interpret rate of change graphs.
Draw and interpret a range of graphs.
Translate a shape on a coordinate grid.
Use a column vector to describe a translation.
Draw a reflection of a shape in a mirror line.
Draw reflections on a coordinate grid.
Describe reflections on a coordinate grid.
Rotate a shape on a coordinate grid.
Describe a rotation.

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Use a column vector to describe a translation.
Draw a reflection of a shape in a mirror line.
Draw reflections on a coordinate grid.
Describe reflections on a coordinate grid.
Rotate a shape on a coordinate grid.
Describe a rotation.
Enlarge a shape by a scale factor.
Enlarge a shape using a centre of enlargement.
Identify the scale factor of an enlargement.
Find the centre of enlargement.
Describe an enlargement.
Transform shapes using more than one transformation
Knowledge, skills and objectives: Vectors and bearings
Add and subtract vectors.
Find the resultant of two vectors.
Subtract vectors.
Find multiples of a vector.
Find and use three-figure bearings.
Use angles at parallel lines to work out bearings.
Solve problems involving bearings and scale diagrams.

GCSE revision- Revision and Preparation for the GCSE Exam Work identifying any gaps in the students' knowledge

	Enlarge a shape by a scale factor. Enlarge a shape using a centre of enlargement. Identify the scale factor of an enlargement. Find the centre of enlargement. Describe an enlargement. Transform shapes using more than one transformation	
Cross curricular link	PSHE and RSE – sexual health English- Functional skills style questions ICT and employability- money and career paths Science- reading graphs Art- accurate drawing	PSHE and RSE – sexual health English- Functional skills style questions ICT and employability- money and career paths Science- reading graphs and conversions PE- map reading and movement Art- accurate drawing
	Year 10	**Year 11**
Spring 1	**Prior Knowledge: Angles, perimeter, area and volume.** Solve angle problems in triangles. Solve geometric problems using side and angle properties of quadrilaterals. Calculate the perimeter and area of rectangles, parallelograms and triangles. Estimate lengths, areas and costs. Calculate a missing length, given the area. Calculate the area and perimeter of trapezia. Find the height of a trapezium given its area. Convert between area measures. Calculate the perimeter and area of shapes made from triangles and rectangles. **Knowledge, skills and objectives: Angles, volume and introduction to Pythagoras** Identify congruent shapes. Understand and use the angle properties of parallel lines. Find missing angles using corresponding and alternate angles. Understand angle proofs about triangles.	**Prior Knowledge: Angles, volume and Pythagoras** Identify congruent shapes. Understand and use the angle properties of parallel lines. Find missing angles using corresponding and alternate angles. Understand angle proofs about triangles. Calculate the interior and exterior angles of regular polygons. Calculate the interior and exterior angles of polygons. Explain why some polygons fit together and some others do not Solve angle problems using equations. Solve geometrical problems showing reasoning. Calculate the surface area of a cuboid. Calculate the surface area of a prism. Calculate the volume of a cuboid. Calculate the volume of a prism. Solve problems involving surface area and volume. Convert between measures of volume. Understand Pythagoras' theorem. Calculate the length of the hypotenuse in a right-angled triangle. Solve problems using Pythagoras' theorem. Calculate the length of a shorter side in a right-angled triangle.

	Calculate the interior and exterior angles of regular polygons. Calculate the interior and exterior angles of polygons. Explain why some polygons fit together and some others do not Solve angle problems using equations. Solve geometrical problems showing reasoning. Calculate the surface area of a cuboid. Calculate the surface area of a prism. Calculate the volume of a cuboid. Calculate the volume of a prism. Solve problems involving surface area and volume. Convert between measures of volume. Understand Pythagoras' theorem. Calculate the length of the hypotenuse in a right-angled triangle. Solve problems using Pythagoras' theorem. Calculate the length of a shorter side in a right-angled triangle.	**Knowledge, skills and objectives: Perimeter, area and volume (circles)** Calculate the circumference of a circle. Solve problems involving the circumference of a circle. Calculate the circumference and radius of a circle. Work out percentage error intervals. Work out the area of a circle. Work out the radius or diameter of a circle. Solve problems involving the area of a circle. Give answers in terms of π. Understand and use maths language for circles and perimeters. Work out areas of semicircles and quarter circle and perimeters. Solve problems involving sectors of circles. Solve problems involving areas and perimeters of 2D shapes. Work out the volume and surface area of cylinders. Work out the volume of a pyramid. Work out the surface area of a pyramid. Work out the surface area of a cone. **GCSE revision-** Revision and Preparation for the GCSE Exam Work identifying any gaps in the students' knowledge
Cross curricular link	PSHE and RSE – Respectful relationships English- Functional skills style questions ICT and employability- construction and career paths Art- accurate drawing	PSHE and RSE – Respectful relationships English- Functional skills style questions ICT and employability- construction and career paths Art- accurate drawing
Spring 2	**Prior Knowledge: Fractions, decimals and percentages** Compare fractions. Add and subtract fractions.	**GCSE revision-** Revision and Preparation for the GCSE Exam Work identifying any gaps in the students' knowledge

	Use fractions to solve problems. Find a fraction of a quantity or measurement. Use fractions to solve problems. Multiply whole numbers, fractions and mixed numbers. Simplify calculations by cancelling. Divide a whole number by a fraction. Divide a fraction by a whole number or a fraction. Convert fractions to decimals and vice versa. Write one number as a fraction of another. Convert percentages to fractions and vice versa. Write one number as a percentage of another. Convert percentages to decimals and vice versa. Find a percentage of a quantity. Use percentages to solve problems. Calculate simple interest. Calculate percentage increases and decreases. Use percentages in real-life situations. Calculate VAT (value added tax) **Knowledge, skills and objectives: Fractions, Indices and standard form.** Multiply and divide mixed numbers and fractions. To know and use the laws of indices. Write large numbers in standard form. Convert large numbers from standard form into ordinary numbers. Write small numbers in standard form. Convert numbers from standard form with negative powers of ordinary numbers To multiply and divide numbers in standard form. To add and subtract numbers in standard form.	
Cross curricular link	PSHE and RSE – Knife and gang crime	PSHE and RSE – knife and gang crime

	English- Functional skills style questions ICT and employability- Money, utility bills and career paths	English- Functional skills style questions ICT and employability- Money, utility bills and career paths
	Year 10	**Year 11**
Summer 1	**Prior Knowledge: Equations, Inequalities and Sequences** Revisit sequences including term-to-term rules. Develop the use of mathematical language to describe sequences. Demonstrate how sequences can be used as a mathematical model to describe patterns. Generate sequences from practical sequences, describing how patterns grow. Continue sequences arising from practical contexts and use them to answer questions. Read, generate and plot coordinates Identify and use position-to-term rules. Write the nth term of a sequence using algebra. Recognise the relationships between term-to-term rules, position-to-term rules and nth terms **Knowledge, skills and objectives:** Understand and use inverse equations. Rearrange simple linear equations. Solve simple linear equations. Solve two-step equations. Solve linear equations with brackets. Solve equations with unknowns on both sides. Use correct notation to show inclusive and exclusive inequalities. Solve simple linear inequalities. Write down whole numbers which satisfy an inequality. Represent inequalities on a number line. Solve two-sided inequalities. Substitute values into formulae and solve equations. Change the subject of a formula. Know the difference between an expression, an equation, a formula and an identity.	**GCSE revision-** Revision and Preparation for the GCSE Exam Work identifying any gaps in the students' knowledge.

	Recognise and extend sequences. Use the nth term to generate terms of a sequence. Find the nth term of an arithmetic sequence.	
Cross curricular link	PSHE and RSE – sexual health English- Functional skills style questions ICT and employability- money and career paths Art- patterns	PSHE and RSE – sexual health English- Functional skills style questions ICT and employability- money and career paths Art- patterns
Summer 2	**Prior Knowledge: Ratio, Probability and proportion** Understand mutually exclusive and exhaustive outcomes. Use two-way tables to record the outcomes from two events. Work out probabilities from sample space diagrams. Find and interpret probabilities based on experimental data. Make predictions from experimental data. Use Venn diagrams to work out probabilities. Understand the language of sets and Venn diagrams. Write a ratio in its simplest form. Solve problems using ratios. Solve simple problems using ratios. Use ratios to convert between units. Write and use ratios for shapes and their enlargements. Divide a quantity into 2 parts in a given ratio. Divide a quantity into 3 parts in a given ratio. Solve word problems using ratios. Use ratios involving decimals. Compare ratios. Solve ratio and proportion problems. Use the unitary method to solve proportion problems. Solve proportion problems in words. Work out which product is better value for money **Knowledge, skills and objectives: Algebra and quadratic equations** Use correct algebraic notation.	

	Write and simplify expressions. Use the index laws. Multiply and divide expressions. Substitute numbers into expressions.	
Cross curricular link	PSHE and RSE – Respectful relationships English- Functional skills style questions ICT and employability- career paths Art- accurate drawing	