YEAR 10 MATHS

YEAR 10 MATHS INTENT	Students will continue to develop and extend their knowledge through learning new concepts. They will also be able to interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning. They will extend their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically. Looking closely at analysis and interpretation of data will develop students' oracy skills and will allow them to explore mathematical data in the real world.

Exam Information (Y10-11)	**Board:**	**Edexcel**
	Qualification:	**Level 1/Level 2 GCSE (9–1) in Mathematics (1MA1)**
	Website link to specification/resources:	Maths GCSE | Edexcel GCSE Mathematics (2015) | Pearson qualifications

Autumn 1	Autumn 1	Spring 1	Spring 2	Summer 1	Summer 2
1 Number		**6 Graphs**		**11 Multiplicative reasoning**	
1.1 Number problems and reasoning		6.1 Linear graphs		11.1 Growth and decay	
1.2 Place value and estimating		6.2 More linear graphs		11.2 Compound measures	
1.3 HCF and LCM		6.3 Graphing rates of change		11.3 More compound measures	
1.4 Calculating with powers (indices)		6.4 Real-life graphs		11.4 Ratio and proportion	
1.5 Zero, negative and fractional indices		6.5 Line segments		**12 Similarity and congruence**	
1.6 Powers of 10 and standard form		6.6 Quadratic graphs		12.1 Congruence	
1.7 Surds		6.7 Cubic and reciprocal graphs		12.2 Geometric proof and congruence	
2 Algebra		6.8 More graphs		12.3 Similarity	
2.1 Algebraic indices		**7 Area and volume**		12.4 More similarity	
2.2 Expanding and factorising		7.1 Perimeter and area		12.5 Similarity in 3D solids	
2.3 Equations		7.2 Units and accuracy		**13 More trigonometry**	
2.4 Formulae		7.3 Prisms		13.1 Accuracy	
2.5 Linear sequences		7.4 Circles		13.2 Graph of the sine function	
2.6 Non-linear sequences		7.5 Sectors of circles		13.3 Graph of the cosine function	
2.7 More expanding and factorising		7.6 Cylinders and spheres		13.4 Graph of the tangent function	
3 Interpreting and representing data		7.7 Pyramids and cones		13.5 Calculating areas and the sine rule	
3.1 Statistical diagrams 1		**8 Transformations and constructions**		13.6 The cosine rule and 2D trigonometric problems	
3.2 Time series		8.1 3D solids		13.7 Solving problems in 3D	
3.3 Scatter graphs		8.2 Reflection and rotation		13.8 Transforming trigonometric graphs 1	
3.4 Line of best fit		8.3 Enlargement		13.9 Transforming trigonometric graphs 2	
3.5 Averages and range		8.4 Transformations and combinations of different transformations		**14 Further statistics**	
3.6 Statistical diagrams 2		8.5 Scale drawings and bearings		14.1 Sampling	
4 Fractions, ratio and percentages		8.6 Constructions 1		14.2 Cumulative frequency	
4.1 Fractions		8.7 Constructions 2		14.3 Box plots	
4.2 Ratios		8.8 Loci		14.4 Drawing histograms	
4.3 Ratio and proportion		**9 Equations and inequalities**		14.5 Interpreting histograms	
4.4 Percentages		9.1 Solving linear inequalities		14.6 Comparing and describing distributions	
4.5 Fractions, decimals and percentages		9.2 Solving quadratic equations 1		**15 Equations and graphs**	
Book 1 Mixed exercise 1		9.3 Solving quadratic equations 2		15.1 Solving simultaneous equations graphically	
5 Angles and trigonometry		9.4 Completing the square		15.2 Representing inequalities graphically	
5.1 Angle properties of triangles and quadrilaterals		9.5 Solving simple simultaneous equations		15.3 Quadratic equations	
5.2 Interior angles of a polygon		9.6 More simultaneous equations		15.4 Using quadratic graphs	
5.3 Exterior angles of a polygon		9.7 Solving linear and quadratic simultaneous equations		15.5 Cubic equations	

5.4 Pythagoras' theorem 5.5 Pythagoras' theorem 2 5.6 Trigonometry 1 5.7 Trigonometry 2	**10 Probability** 10.1 Combined events 10.2 Mutually exclusive events 10.3 Experimental probability 10.4 Independent events and tree diagrams 10.5 Conditional probability 10.6 Venn diagrams and set notation	15.6 Using iteration to solve equations
GCSE (9-1) SPEC REFERENCE N2 N3 N4 N5 N6 N7 N8 N9 N14 N15 • Have a firm grasp of place value and be able to order integers and decimals and use the four operations. • Know integer complements to 10 and to 100, multiplication facts to 10 × 10, strategies for multiplying and dividing by 10, 100 and 1000. • Have encountered squares, square roots, cubes and cube roots and have knowledge of classifying integers. • Multiply numbers in a similar format to questions later in the section. • List possible outcomes from two events. • Estimate the value of a square root. • Round numbers to a specified degree of accuracy. • Apply the four operations. • Multiply prime factors together. • List the factors of a number. • Work out simple powers. • Apply the four operations. • Convert between fractions and decimals. • Use the laws of indices for positive indices. • Multiply by powers of 10 when the number is written as an ordinary number and not an index. • Review different ways to divide by 10. • Use negative indices. • Review the meaning of the dot in the recurring notation. • Identify the missing multiple which practices the skills of searching for a perfect square factor. • Use negative numbers with the four operations and recall and use hierarchy of operations and understand inverse operations. • Use a calculator for decimals and negative numbers. • Use index laws numerically. • Use and interpret algebraic notation. • Set up and solve simple equations. • Recall the definitions of geometric and arithmetic sequences. • Recognise that squaring and taking the square roots, and cubing and taking the cube root, are inverse operations. • Calculate with powers. • Simplify algebraic terms, including using index notation. • Multiply a single term over a bracket. • Find highest common factors. • Solve a simple equation expressed in words. • Solve simple algebraic equations • Find lowest common multiples.	**GCSE (9-1) SPEC REFERENCE R2 R6 G1 G2 G7 G8 G12 G13 G15 G24 G25** • Recognise 2D shapes. • Plot coordinates in four quadrants and linear equations parallel to the coordinate axes. • Convert metric measures. • Recognise congruent and similar shapes. • Transform shapes using translation, reflection, rotation and enlargement. • Draw 3D shapes on an isometric grid. • Recognise dimensions of a cuboid. • Draw simple straight lines on a coordinate grid. • Know whether the image is congruent to the original following a reflection or a rotation. • Enlarge shapes on a coordinate grid in one quadrant. • Describe translations. • Convert metric measures and apply to scales. • Accurate drawing of right-angled triangle. • Accurate drawings of triangles given SSS and ASA. • Know the meaning of the terms perpendicular, bisect, arc. • Draw angles with a protractor. • Construct triangles and deduce information from them. • Understand the ≥ and ≤ symbols. • Substitute into, solve and rearrange linear equations. • Factorise simple quadratic expressions. • Recognise the equation of a circle. • Understand inequality signs • Construct correct inequalities from given information • Know that a square has two possible roots • Find the factors of a given number. • Factorise expressions. • Solve simple equations containing a squared term. • Understand the term quadratic • Find positive and negative square roots. • Solve quadratic equations by factorising. • Expand two pairs of brackets. • Simplify surds. • Expand and simplify a square bracket. • Simplify surds. • Solve simple equations, giving the answer in surd form. • Substitute into simple algebraic expressions. • Rearrange equations. • Recall the equation of a straight line. • Solve simple simultaneous equations. • Identify different types of equations.	**GCSE (9-1) SPEC REFERENCE N12 N13 A2 A9 R1 R6 R9 R10 R11 R13 R14 R16** • Find a percentage of an amount and relate percentages to decimals. • Rearrange equations and use these to solve problems. • Know speed = distance/time, density = mass/volume. • Convert between metric units. • Solve simple direct and indirect proportion problems, including currency conversion. • Understand the use of indices. • Work out the decimal multiplier for a percentage increase/decrease. • Calculate simple rates. • Substitute numbers into equations, and solve for the unknown. • Use speed = distance/time to solve problems. • Convert between metric units. • Recall the formulae for the area of a circle and volume of a prism. • Rearrange formulae. • Recognise graphs of y = x and y = 1/x. • Find the gradient of a line given its equation. • Decide whether quantities are in direct proportion. • Recognise and enlarge shapes and calculate scale factors. • Know how to calculate area and volume in various metric measures. • Measure lines and angles, and use compasses, ruler and protractor to construct standard constructions. • Recognise congruent shapes. • Know basic angle facts. • Know the angle sum of interior angles of a triangle. • Recognise congruent shapes. • Recall basic angle facts. • Find missing lengths using Pythagoras' theorem. • Know the conditions of congruence and use correct mathematical notation for equal angles and sides. • Recall the properties of special triangles and quadrilaterals. • Use geometric properties to find similarities and differences between given polygons. • Calculate scale factors. • Find area scale factor, given length scale factor. • Work out the volume and surface area of a cube. • Convert between metric units. • Work out cubes and cube roots. • Use axes and coordinates to specify points in all four quadrants. • Recall and apply Pythagoras' Theorem and trigonometric ratios. • Substitute into formulae. • Find upper and lower bounds of a given measurement. • Know the exact values of sin θ for θ = 30°, 45° , 60° and 90° • Use Pythagoras' theorem.

• Substitute values into a one-step formula. • Write numbers in standard form. • Find the next term of a given arithmetic sequence. • Substitute values in a simple linear expression. • Write terms in a sequence given the nth term. • Use a function machine to find outputs. • Find the next term of given sequences. • Identify arithmetic and geometric sequences. • Find the term-to-term rule for a sequence. • Recalling a square root. • Finding the factor pairs of small integers. • Read scales on graphs, draw circles, measure angles and plot coordinates in the first quadrant. • Have experience of tally charts. • Use inequality notation. • Find midpoint of two numbers. • Find the range, mean, median and mode of a data set. • Work out mode, median and range from a list of numbers. • Identify trends by noticing whether sequences of numbers increase, decrease or oscillate. • Recognise when a line has a positive, negative or zero gradient. • Plot points on a coordinate grid, and identify points that do not lie on a straight line. • Understand and be able to define the meaning of correlation. • Read values from graphs. • Find the range of a list of numbers. • Find the midpoint of two numbers. • Use subtraction to find missing values. • Draw a bar chart. • Draw a pie chart. • Know the four operations of number. • Find common factors. • Have a basic understanding of fractions as being 'parts of a whole'. • Define percentage as 'number of parts per hundred'. • Be aware that percentages are used in everyday life. • Use ratio notation, and to write a ratio in its simplest form. • Identify unit fractions, improper fractions and mixed numbers. • Multiply a whole number by a fraction. • Know the priority of operations. • Multiply a fraction by its reciprocal for a product of 1. • Simplify ratios. • Write ratios in the form n : 1. • Write one number as a proportion of the total. • Identify equivalent ratios. • Find a percentage of a given amount. • Work out percentage multipliers. • Convert between fractions, decimals and percentages. • Solve simple equations.	• Solve quadratic equations. • Understand that a probability is a number between 0 and 1, and distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur. • Mark events and/or probabilities on a probability scale of 0 to 1. • Know how to add and multiply fractions and decimals. • Express one number as a fraction of another. • List all outcomes for a single event systematically. • Make predictions from experimental data. • Complete a two-way table. • List all outcomes for a single event systematically. • List all outcomes for two events systematically. • Add decimals. Subtract decimals and fractions from 1. • Understand the relationship between ratios and fractions. • Simplify fractions. • Multiply whole numbers by decimals. • Add and multiply fractions and decimals. • Know that the probability of something not happening is 1 minus the probability of the event happening. • Draw and use probability tree diagrams. • Interpret inequalities. • Use Venn diagrams.	• Find angles using the sin function. • Know the exact values of cos θ for θ = 30°, 45° , 60° and 90° • Use Pythagoras' theorem. • Find angles using the cos function. • Know the exact values of tan θ for θ = 30°, 45° , 60° • Use Pythagoras' theorem. • Find angles using the tan function. • Calculate the area of a triangle using (1/2)b × h • Know the formula for calculating the area of a circle. • Use trigonometry • Use bearings • Calculate the area of a triangle. • Solve calculations. • Use the sine and cosine rule. • Reflect and rotate a coordiante point. • Know the exact values of sin θ and cos θ for θ = 0°, 30°, 45° , 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60° • Sketch y = sinx, y = cosx and y= tanx for x from 0° to 360° • Translate coordinate points by column vectors. • Understand negative translations. • Understand the different types of data: discrete/continuous. • Have experience of inequality notation. • Multiply a fraction by a number. • Understand the data handling cycle. • Use fractions and percentages to work out data from a table. • Find the median of a data set. • Find the median and range from a stem-and-leaf diagram. • Division calculations • Draw a frequency diagram. • Write the modal class • Estimate the mean mass. • Write the modal class • Estimate the mean mass. • Work out the mean, median and mode of data sets. • Work out the mean and range from a table. • Solve quadratics and linear equations. • Solve simultaneous equations algebraically. • Know and draw graphs of circles. • Know which integers satisfy an inequality • Solve inequalitites with one variable and show solution using set notation. • Solve quadratic equations by factorising. • Sketch simple quadratic graphs • Find coordinates of maximum point. • Understand manimum and minimum points. • Find roots of an equation by completing the square and using the quadratic formula. • Know where a graph will cross the x-axis • Expand and simplify double brackets • Find roots of a quadratic equation by completing the square • Know where a graph will cross the x-axis

• Rearrange simple formulae and equations, as preparation for rearranging trig formulae. • Recall basic angle facts. • Understand that fractions are more accurate in calculations than rounded percentage or decimal equivalents. • Recall the properties of special types of triangles and quadrilaterals. • Recognise special types of triangle and quadrilateral. • Recall basic angle facts. • Name polygons and understand the meaning of 'regular polygon'. • Substitute numbers into an expression. • Find missing angles in triangles, quadrilaterals and at a point. • Find missing angles on a straight line. • Calculate the sum of interior angles of a polygon. • Recall square numbers and square roots. • Find the area of a square. • Find square roots. • Recognise perfect squares. • Use Pythagoras' theorem to find the length of the hypotenuse. • Convert fractions to decimals. • Identify the hypotenuse. • Use the angle sum of a triangle to work out missing angles. • Identify the opposite and adjacent sides of a given angle in right-angled triangles. • Use the trigonometric ratios to find lengths in right-angled triangles.		