

YEAR 8 MATHS

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| YEAR 8 MATHS INTENT | In Year 8 students will start to apply mathematical knowledge in varying contexts. They will develop algebraic and graphical fluency, including understanding linear functions. Learners will be able to use subject specific terminology to analyse numbers, algebraic expressions and describe properties of 2-D and 3-D shapes. They will be able to select the most appropriate method for solving problems developing their reasoning and conceptual understanding within the subject. |
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| 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 | Autumn 2 | Autumn 2 | Spring 1 | Spring 1 |
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| Number | Area and Volume | Statistics, graphs and charts | Expressions and equations | Real life Graphs | Decimals and Ratio |
| Timetables Divisibility rules BIDMAS Knowing how to use the scientific calculator Calculating with negative numbers Prime factor decomposition | Calculating perimeter and area of composite shapes. Calculating surface area of 3D shapes Calculating volume of 3D shapes Converting between units and squared units. | Calculating averages (Mean, Mode, Median and Range) from listed data, stem and leaf diagrams, frequency tables. Create and analyse stem and leaf diagrams, bar charts, scatter graphs and pie charts. Comparing data using averages | Expanding brackets Factorising expression Finding the input and output of function machines Solving expression using the balancing method. | Drawing and analysing distance time-graphs Drawing and analysing Real life graphs Drawing and analysing line graphs | Estimating calculations by rounding numbers to 1 significant figure Multiplying decimals Dividing decimals Simplifying ratio Dividing quantity into a given ratio |
| Mastery: Know when the negative square root is an appropriate solution to a problem. Understand that prime numbers are the building blocks for the natural numbers - ie that all numbers can be written as. Understand when to use HCF and LCM to find the answer to worded problem. Securing: Calculate using squares, square roots, cubes and cube roots. Give integers that a square root lies between. Calculate combinations of squares, square roots, cubes, cube roots and brackets. Use index notation. Write a number as a product of its prime factors. Use prime factor decomposition to find the HCF and LCM. Developing: To be able to do basic calculations with positive and negative numbers. Calculate using squares, square roots and cube numbers. To know the | Mastery: To be able to calculate the perimeter and area of composite shapes. Apply formulae to find missing lengths. To work out the volume and surface area of composite shapes. To be able to convert between area and volume metric units. Securing: To be able to calculate the perimeter and area of all 2D shapes including composite shapes. To do problem-solving involving volume and surface area of cubes and cuboids. Solve problems in everyday contexts involving measures between area, volume and capacity. Developing: To be able to calculate the perimeter and area of simple shapes, triangles and rectangles. To calculate the volume and surface area of cubes and cuboids. To know how to convert between metric units. | Mastery: Students have a deeper understanding of which graphs/charts represent the data best. Students are able to create more challenging graphs and charts such as back to back stem and leaf diagrams. Students are able to find missing values when given averages of sets of data. They are able to calculate the averages and understand their meaning in context. Students are able to compare using averages of data sets in context. Securing: Students begin to understand which graphs/charts will represent the data best. Students are able to create bar charts, stem and leaf diagrams, scatter and basic pie charts. Students are able to calculate averages from sets of data including frequency tables and stem and leaf diagrams. Students can also identify patterns or relationships in the data. Students are able to compare | Mastery: Students can expand single and double brackets including powers, coefficients of x, negative values and fractions. Students can factorise more challenging expressions that include multiple terms, including negative coefficients. Students can solve all linear equations including those with fractional and negative terms. Securing: Students can expand single brackets, including powers, coefficients of x and negative values. Students can factorise expressions that include powers and coefficients of x. Students can solve one and two-step equations including equations with unknowns on both sides. Developing: Students are able to expand single brackets including squared values. Students are able to factorise simple expressions. Students can solve one and two step equations using function machines and balancing method. | Mastery: Convert between measures on distance time graphs and use this to calculate speed at any point on the graph. Identify seasonal trends from data represented on a line graph. Have an understanding that interpolated values give a more accurate value than extrapolated values. Solve real life problems by interpreting the trends shown in real-life graphs. Understanding when to use curved and straight lines to join up points on graphs. Securing: To plot and use distance time graphs to solve problems in context. To plot and use line graphs to identify trends within the data. Draw and interpret real life graphs, including curved graphs, to solve real life problems in context. Developing: To interpret and draw simple distance time-graphs. To plot and use line graphs to identify trends within the data. Draw and interpret a range of real-life graphs. | Mastery: Apply rounding of decimals to significant figures to estimating calculations. Understanding the impact that rounding will have on accuracy of the answers produced. Apply the inverse relationship of multiplication and division of decimals to solve problems. Deepen understanding of decimal, ratio and proportion calculations by working out problems in real life contexts. Securing: Ordering positive and negative decimals and rounding to a given decimal place or significant figure. Able to choose a suitable degree of accuracy when rounding. Multiply and divide with decimals with up to two decimal places. Solve ratio and proportion problems involving decimals. Divide quantity into 3 part ratios. Developing: Ordering positive and negative decimals and rounding to a given decimal place. Carry out |

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| divisibility rules. Use index notation. Write a number as a product of its prime factors | | using averages of data sets and the shape of line graphs or pie charts. Developing: Students can represent data with bar charts, stem and leaf diagrams, scatter and basic pie charts. Students can calculate averages from sets of data. Students can make basic comparison between sets of data. | | | multiplication of large numbers and decimals and divide by decimals. Simplify and write equivalent ratios and divide quantity into a given ratio. Solve ratio and proportion problems. |
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| Spring 2 | Summer 1 | Summer 1 | Summer 2 |
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| Lines and angles | Calculating with Fractions | Straight-line graphs | Percentage, decimal and fractions |
| Solve geometric problems. Finding interior and exterior angles in polygons by applying key rules. Finding angles in parallel lines and the reasons attached. Properties of a quadrilateral | Calculating with fractions Finding the reciprocal of a fraction Converting between mixed numbers and improper fractions Calculating with mixed numbers | Plotting straight line graphs Finding gradients of a line Forming line equations in the form $y=mx + c$ Direct proportion graphs | Increasing and decreasing by a percentage (Both calculator and non-calculator method) Calculating the percentage change Equivalent fraction, decimals and percentage |
| Mastery: Solve angle problems in parallel and intersecting lines using a combination of angle rules. Can apply these rules to other 2D shapes e.g Parallelogram. Solve geometric problems involving both algebra and exterior/interior angles in polygons. Can name all quadrilaterals and their properties, then use this to solve geometric problems. Securing: Solve problems using properties of angles in parallel lines and intersecting lines. Can give reasons for their answers e.g. Corresponding angles are equal. Find the sum of interior and exterior angles of a polygon and use these to find individual angles. Can name quadrilaterals and their properties, then use this to solve geometric problems. Developing: Solve problems using properties of angles in parallel lines and intersecting lines. Find the sum of interior and exterior angles of a polygon and use these to find some individual angles. Can name quadrilaterals based on both their shape and their properties. | Mastery: Solve worded problems by adding and subtracting fractions, including negatives fractions with different denominators. Able to apply BIDMAS into calculations of fractions including multiplication and division. Can work apply inverse operations to fraction calculations to solve problems. Understand the four operations with mixed numbers, where one or more mixed number is negative, or the answer is a negative mixed number. Securing: Solve worded problems by adding and subtracting fractions with different denominators. Able to multiply fractions and also fractions with integers fluently. Able to divide integers by fractions, fractions by fractions, through finding the reciprocal of the second fraction. Can convert between mixed numbers and improper fractions. Additionally, can use the calculate with mixed numbers using the four operations. Developing: Add and Subtract fractions with different denominators. Able to multiply fractions and fractions with integers. Dividing integers and fractions by fractions. Can convert between mixed numbers and improper fractions. | Mastery: Write equations of straight-line graphs and plot them accurately on graphs. Identify reflective symmetry between related graphs with different equations. Understand the relationship between the gradients of the graph when the quantities are plotted against each other. Recognise when values on a graph are in direct proportion and when they aren't. Able to plot graphs that show direct proportion and accurately read values to help solve problems.. Securing: Write the equations of straight-line graphs in the form $y = mx + c$. Then use the equation to plot the straight line on a graph. Calculate the gradient of straight-line graphs that are both positive and negative. Begin to understand what the gradient represents when quantities are plotted against each other. Recognise when values are in direct proportion with or without a graph. Able to plot graphs that show direct proportion and accurately read values to help solve problems. Developing: Write the equations of straight-line graphs in the form $y = mx + c$. Calculate the gradient of straight-line graphs. Recognise when values are in direct proportion with or without a graph. Able to plot graphs that show direct proportion and accurately read values. | Mastery: Compare more than two proportions by finding equivalent fractions, decimals and percentages. Able to compare and interpret proportions involving decimals. Can fluently calculate increase or decrease in percentage using either calculator on non-calculator methods. Can work inversely using the unitary method to calculate original amounts after percentage change. Recognise where fractions of time and other measures result in a terminating or recurring decimal. Securing: Use different methods to find equivalent fractions, decimals and percentages allowing you to compare different proportions. To calculate amounts increased or decreased by a percentage using mental strategies. Fluently find multipliers to enable you to calculate amounts increased or decreased by a percentage. Can recognise terminating and reoccurring decimals and can change time into decimal form. Developing: Use different methods to find equivalent fractions, decimals and percentages. To calculate amounts increased or decreased by a percentage, using mental strategies. Can find some multipliers used to increase and decrease by percentage. Can recognise terminating and reoccurring decimals and can change some time into decimal form. |