

|  |  |  |  |
| --- | --- | --- | --- |
| **Year 10 Maths** | | | |
| **Unit 1: Highest Common Factor / Lowest Common Multiple** | **Unit 2: Probability** | | **Unit 3: Forming and Solving Equations** |
| In this topic students recall knowledge of different types of numbers and LCM and HCF. It is developed by looking at wordy problem-solving questions.  **Keywords for this Unit**  **Product:** the answer when you multiply two or more numbers together  **Multiple:** the numbers in a given number’s times table  **Factor:** the numbers that divide into a given number exactly | This topic consolidates KS3’s understanding and learning of probability. Students will investigate different questions and decide whether to use a Venn diagram, a probability tree or sample space to support.  **Keywords for this Unit**  **Probability:** The chance of something happening  **Outcome:** The result of an activity in probability  **Mutually:** Exclusive: Events that cannot happen at the same time  **Sum:** The answer when you add two or more numbers together | | This topic consolidates KS3’s understanding and learning of forming and solving equations. Students will discover more complex questions within this unit.  **Keywords for this Unit**  **Form:** Create an expression/equation  **Equation:** An algebraic expression where the two sides of the “=” are equal in value  **Solve:** The numerical solution(s) that makes an equation true |
| **Unit 4: Charts and Graphs** | **Unit 5: Sequences** | | **Unit 6: Percentages** |
| This topic consolidates KS3’s understanding and learning of all charts and graphs. Students aiming for the higher GCSE will discover how to draw and interpret histograms.  **Keywords for this Unit**  **Histogram:** A graph where the AREA of the bars are equal to the frequency  **Frequency:** The number of times an outcome is recorded  **Cumulative:** Adding the frequencies as we move through the groups (a running total) | This topic consolidates KS3’s understanding and learning of sequences. Students aiming for the higher GCSE will continue to investigate and use sequences with quadratics.  **Keywords for this Unit**  **Term:** A specific number/picture in a sequence  **Quadratic:** A sequence whose nth term contains n2 as its highest power  **Geometric:** A sequence whose term-to-term rule is multiplication  **Fibonacci:** A sequence formed by adding the previous two terms together to give the next term | | This topic consolidates KS3’s understanding and learning of increase and decrease compound and simple percentages, percentage change and reverse percentage.  **Keywords for this Unit**  **Percentage:** An amount out of 100  **Depreciate:** An amount losing value (decreasing)  **Reverse:** Working backwards from a sale price, for example, to find the original price  **Compound:** Interest that builds on itself, not just on the initial amount. |
| **Unit 7: Speed Distance Time** | **Unit 8: Fractions** | | **Unit 9: Volume** |
| This topic consolidates KS3’s understanding and learning of speed, distance and time. Students will continue to use this knowledge to look at complex questions with two types of data. They will also look at density and pressure.  **Keywords for this Unit**  **Speed:** Compound measure distance time (how much distance is covered in a given amount of time)  **Density:** Compound measure mass volume (how much mass a given volume “weighs”)  **Pressure:** Compound measure force area (how much force a given area exerts on a surface)  **Convert:** Change from one unit to another | This topic consolidates KS3’s understanding and learning of fractions. They will recall calculations using fractions and fractions of amount.  **Keywords for this Unit**  **Equivalent:** Two fractions that are worth the same amount (the numerator and denominator have been multiplied by the same value) | | This topic consolidates KS3’s understanding and learning of shapes. Recapping on perimeter and area and then developing skills on find volume of all shapes.  **Keywords for this Unit**  **Volume:** The amount of 3D space a shape takes up, measured in cubic units  **Prism:** A 3D shape, with straight edges and a constant cross-section  **Cylinder:** A 3D shape made of a constant circular cross-section  **Compound shape:** A 3D shape made up of other connected shapes  **Pyramids:** A 3D shape with a square or rectangular base, and triangular faces up to a point  **Cones:** A 3D shape with a circular base, and a curved face up to a point  **Frustum:** A pyramid with the top cut off parallel to the bottom |
| **Unit 10: Pythagoras and Trigonometry** | **Unit 11: Straight Line Graphs** | | **Unit 12: Similarity and Congruency** |
| This topic consolidates KS3’s understanding and learning of Pythagoras and trigonometry and developing this by looking at 3D shapes. students studying the higher GCSE will start to look at non-right-angle triangles.  **Keywords for this Unit**  **Hypotenuse:** The longest side in a right-angled triangle  **Adjacent:** The side in a right-angled triangle joining the right-angle to the other given angle  **Opposite:** The side in a right-angled triangle across from the given angle  **Sine:** Trigonometric ratio (Opposite ÷ Hypotenuse)  **Cosine:** Trigonometric ratio (Adjacent ÷ Hypotenuse)  **Tangent:** Trigonometric ratio (Opposite ÷ Adjacent) | This topic consolidates KS3’s understanding and learning of plotting straight line and quadratic graphs. Students will develop their knowledge by looking at turning points and finding exact points on a graph.  **Keywords for this Unit**  **Gradient:** The steepness of a graph (vertical change ÷ horizontal change)  y-intercept: Where a graph crosses the y-axis  **Equation of a straight line:** Usually written in the form y = mx + c  **Linear:** An equation that produces a straight line graph | | Students will discover the difference between similar and congruent shapes. They will use their knowledge of ratio and scale factors to find similar shapes and construction skills to proof congruent shapes.  **Keywords for this Unit**  **Congruent:** Two shapes are congruent if they are exactly the same size and shape, but can be rotated or reflected  **Similar:** Two shapes are similar if one is an enlargement of the other, where all sides have been multiplied by the same scale factor, and all angles remain the same.  **Scale Factor:** The multiplicative link between sides in similar shapes |
| **Unit 13: Error intervals and Bounds** | **Unit 14: Simultaneous Equations** | | **Unit 15: Fractional and Negative Indices** |
| This topic consolidates KS3’s understanding and learning of rounding and bounds. In this topic students will develop this skill by being introduced to error intervals.  **Keywords for this Unit**  **Decimal place:** Rounding to a certain number of places after the decimal point  **Significant figure:** Rounding to a certain number of key, important numbers after the beginning of a number  **Upper bound:** The maximum amount a number could have been before rounding  **Lower bound:** The minimum amount a number could have been before rounding  **Error interval:** An inequality showing the range of values a number could have been before rounding | This topic consolidates KS3’s understanding and learning of solving and solving simultaneous equations. Students will develop this by plotting graphs and finding the coordinates. The higher GCSE students will focus on algebraic simultaneous equations.  **Keywords for this Unit**  **Simultaneous Equations:** A pair (or more) of equations that need to be solved together, rather than independently  **Solve:** The numerical solution(s) that makes an equation true  **Variable:** One of the unknowns in an equation, shown by a letter  **Coefficient:** The number multiplying a variable in an equation (written in front of the letter) | | This topic consolidates KS3’s understanding and learning of index laws including negative and fractional indices. Students will practise complex GCSE questions with indices in them.  **Keywords for this Unit**  **Index/indices:** A small number, written in the top right above a base number, that shows how many times that base number has been multiplied together  **Fractional:** An index that is a fraction, telling us to take the root of the base number  **Root:** The opposite of squaring or cubing (or taking another power) of a number  **Negative:** An index that is negative, telling us to take the reciprocal of the positive index  **Reciprocal:** One over the positive index, usually written as a fraction |
| **Unit 16: Transformations** | **Unit 17: Angles in Polygons and Parallel Lines** | | **Unit 18: Changing the Subject of a Formula** |
| This topic consolidates KS3’s understanding and learning of transformations. Students will develop how to describe mixed transformation.  **Keywords for this Unit**  **Rotation:** Transformation that turns a shape  **Reflection:** Transformation that mirrors a shape across a line  **Translation:** Transformation that moves a shape, without rotating or reflecting it  **Enlargement:** Transformation that changes the size of a shape  **Clockwise/anticlockwise:** The direction of turn  **Centre (of rotation/enlargement):** The point that a transformation begins from  **Vector:** A column of two numbers that describe a translation  **Scale factor:** The multiplicative link between sides in similar shapes | This topic consolidates KS3’s understanding and learning of 2D shapes especially polygons. Students will develop their description skills of explaining missing angles.  **Keywords for this Unit**  **Polygon:** A closed 2D shape, made up of straight lines  **Regular:** A polygon where all the sides are equal and all the angles are equal  **Interior:** The angle inside a polygon  **Exterior:** The angle outside a polygon that forms an extended straight line with the interior angle  **Transverse:** A straight line cutting across two parallel lines to form eight angles  **Alternate:** Two equal angles in parallel lines, shown with a Z shape (on opposite sides of the transverse line)  **Corresponding:** Two equal angles in parallel lines, shown with an F shape (in the same position with regards to the transverse line, but on a different parallel line) **Co-interior:** Two equal angles in parallel lines, shown with a C shape (between the two parallel lines, on the same side of the transverse line) | | This topic consolidates KS3’s understanding and learning of rearranging formula. Students will understand how to make something the subject of a formula and rearrange complex equations.  **Keywords for this Unit**  **Subject:** The variable on its own on one side of the equals sign in a formula or equation  **Rearrange:** Use inverse operations to change a formulae around, usually to make another variable the subject |
| **Year 11 Maths Foundation** | | | |
| **Unit 1: Percentages / FDP** | **Unit 2: Algebra** | | **Unit 3: Charts and Graphs** |
| This topic consolidates the 4 years learning and understanding of fractions, decimals, percentages, and the links between them, developing practise for their GCSE.  **Keywords for this Unit**  **Multiplier:** A decimal used to calculate a percentage of an amount, or after an increase/decrease, by multiplying.  **Decrease:** Subtracting a certain percentage from the original total to find the new amount  **Increase:** Adding a certain percentage to the original total to find the new amount  Depreciate: To go down in value | This topic consolidates the 4 years learning and understanding of algebra, including collecting terms, simplifying expressions and links between different aspects of algebra, developing practise for their GCSE.  **Keywords for this Unit**  **Factorise:** Put in to brackets by removing a common factor  **Simplify:** Collect like terms together to make an expression shorted and easier  **Expand:** Multiply out brackets  Substitute: Replace a letter in an expression with the number it is worth  **Quadratic:** An expression with x2 as the highest power | | This topic consolidates the 4 years learning and understanding of charts, graphs and data handling, developing practise for their GCSE.  **Keywords for this Unit**  **Frequency:** The amount of times something occurs or was recorded  **Histogram:** A chart where the area of a bar represents the frequency  **Class width:** The width of a group in the table, and the bar in a histogram  **Frequency density:** Frequency ÷ class width  **Cumulative:** A running total of frequencies  **Frequency polygon:** A line graph joining the midpoints of the top of the bars, to give a picture of the shape of the data distribution |
| **Unit 4a: Angles and Parallel lines** | **Unit 4b: Ratio** | | **Unit 5: Graph plotting** |
| This topic consolidates the 4 years learning and understanding of angle facts, specifically angles in parallel lines, developing practise for their GCSE.  **Keywords for this Unit**  **Parallel:** Two lines that remain the same distance apart forever, and will never meet  **Transverse:** A straight line cutting across two parallel lines to form eight angles  **Corresponding:** Two equal angles in parallel lines, shown with a F shape (in the same position with regards to the transverse line, but on a different parallel line)  **Alternate:** Two equal angles in parallel lines, shown with a Z shape (on opposite sides of the transverse line)  **Co-interior:** Two equal angles in parallel lines, shown with a C shape (between the two parallel lines, on the same side of the transverse line) | This topic consolidates the 4 years learning and understanding of ratios, linking it to fractions and proportion, and developing practise for their GCSE.  **Keywords for this Unit**  **Ratio:** A part-to-part comparison, written a : b  **Proportion:** Quantities that vary by a set multiple | | This topic consolidates the 4 years learning and understanding of plotting graphs, from basic coordinate plotting, to substituting in to equations and then plotting them, developing practise for their GCSE.  **Keywords for this Unit**  **Axes:** A pair of lines, one vertical and one horizontal, that form a grid of points to plot graphs  **Straight Line Graph:** A graph, whose equation can be written in the form y = mx + c, that forms a straight line when plotted  **Quadratic:** An expression with x2 as the highest power  **Quadratic Graph:** A parabolic graph, whose equation contains x2 |
| **Unit 6: Indices and Standard Form** | **Unit 7: SDT** | | **Unit 8: Probability and Venns** |
| This topic consolidates the 4 years learning and understanding of indices and index laws, and the specific focus on standard form, developing practise for their GCSE.  **Keywords for this Unit**   * **C5 types of numbers** * **C14 properties of shapes** * **D1 Number** | This topic consolidates the 4 years learning and understanding of speed, distance and time, developing practise for their GCSE, and potentially branching out in to other compound measure.  **Keywords for this Unit**   * **C1 Mathematical operations** * **C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)** * **C10 Measures (perimeter, area, volume etc)** * **D1 Number** * **D5 Geometry and Measure** | | This topic consolidates the 4 years learning and understanding of probability, and using different diagrams to represent and combine probabilities, developing practise for their GCSE.  **Keywords for this Unit**   * **C1 Mathematical operations** * **C3 FDPR** * **C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)** * **C15 Data Handling (including averages, charts and graphs)** * **D1 Number** * **D6 Probability** |
| **Unit 9: Pythagoras and Trigonometry** | | **Unit 10: Focus on the first 10 questions** | |
| This topic consolidates the 4 years learning and understanding of types of numbers, focussed specifically on the sides and angles in right-angled triangles, and the two theorems (Pythagoras and Trigonometry) that help us calculate them.  **Keywords for this Unit**  **Square:** The result when a number is multiplied by itself  **Root:** The inverse of squaring  **Right-angle:** The angle of 90o  **Pythagoras:** A theorem linking the size of the three sides of a right angled triangle  **Trigonometry:** A theorem linking the sides of and angles of a right angled triangle  **Hypotenuse:** The longest side in a right-angled triangle, across the triangle from the right-angle  **Opposite:** The side opposite the given angle in a right-angled triangle  **Adjacent:** The side joining the right-angle to the given angle in a right-angled triangle  **Sin (sine):** One of the trig ratios (Opposite Hypotenuse)  **Cos (cosine):** One of the trig ratios (Adjacent Hypotenuse)  **Tan (tangent):** One of the trig ratios (Opposite Adjacent) | | Students will work through the first 10 questions of various GCSE papers, looking at key topics that are assessed frequently. | |
| **Year 11 Maths Higher** | | | |
| **Unit 1: Recurring Decimals and Indices** | **Unit 2: Surds** | | **Unit 3: Algebraic fractions** |
| This topic consolidates the 4 years learning and understanding of recurring decimals and index laws, developing practise for their GCSE. scenarios using proportion. Looking at best buys and direct and inverse proportion.  **Keywords for this Unit**  **Terminating:** A decimal which has a finite number of digits e.g., it comes to an end and doesn’t go on forever  **Recurring:** A decimal in which a pattern of one or more digits is repeated indefinitely  **Fractional indices:** Indices/powers written as a fraction, indicating a root  **Root:** A number that when multiplied by itself a given amount of times, gives the original number  **Negative indices:** Indices/powers which are less than 0, indicating a reciprocal  **Reciprocal:** The multiplicative inverse of a number (1 divided by the original number) | This topic consolidates the learning and understanding of surds in year 10, preparing them for their GCSE.  **Keywords for this Unit**  **Surd:** Usually square (and cube) roots, but any irrational number  **Irrational number:** A real number that can be written as a decimal that goes on forever without repeating, but not as a fraction  **Denominator:** The bottom number in a fraction  **Rationalise:** Rewrite a fraction, so that the denominator is a rational number rather than a surd | | This topic consolidates the 4 years learning and understanding of fractions and algebra and connects them together into algebraic fractions.  **Keywords for this Unit**  **Solve:** Find the value(s) that make an equation true  **Simplify:** Cancel common factors to make write an algebraic fraction more straightforwardly |
| **Unit 4: Statistics** | **Unit 5: Circle Theorems** | | **Unit 6: Bearings and Trig** |
| In this unit density is introduced. Students have already looked at speed, distance and time but now focus on mass, volume and density within a formula.  **Keywords for this Unit**  **Venn diagram:** A diagram using two or more circles to show the relationship between sets of numbers  **Union:** The combination of two or more sets (the entirety of the circles in a Venn diagram)  **Intercept:** The elements present in two or more sets (the overlap between two circles in a Venn diagram)  **Complement:** The elements not in a set (the area outside a circle in a Venn diagram)  **Conditional:** Probability of one event, based on an event that has already occurred  **Cumulative Frequency:** A running total of frequencies  **Box Plot:** A diagram showing the distribution of a set of data  **Median:** A type of average which is the middle value of an ordered set of data values  **Lower Quartile:** The median of the lower half of an ordered set of data, 25% of the way through the set  **Upper Quartile:** The median of the upper half of an ordered set of data, 75% of the way through the set  **Range:** A measure of spread for a data set, the difference between the lowest and highest values  **Interquartile Range:** A measure of spread for a data set, the difference between the Lower Quartile and Upper Quartile  **Mean:** A type of average, found by taking the total of all mounts, and dividing by how many amounts there were  **Mode:** A type of average, the value that occurs most often in a data set | In this unit indices are developed further by connecting it to standard form. Students will be able to convert large and small numbers into standard form and convert into original numbers.  **Keywords for this Unit**  **Centre:** The point in the middle of a circle, equidistant from all points around the circle  **Chord:** A line from one side of a circle to another, not through the centre  **Segment:** The piece of a circle formed by a chord.  **Diameter:** A line from one side of the circle to the other, through the centre  Semi-circle: Half a circle, split by a diameter  **Cyclic Quadrilateral:** A quadrilateral inscribed inside a circle, where all four points touch the enclosing circle  **Tangent:** A straight line, touching a circle or curve exactly once at a given point | | Students will build on the skills of plotting coordinates to draw linear graphs. Students will use substituting skills to find coordinates to plot.  **Keywords for this Unit**  **Bearing:** The angle of direction in relation to a north line, measure in degrees from north in a clockwise direction  **Trigonometry:** The links between the sides and angles in triangles, and the associated calculations |
| **Unit 7: Vectors** | **Unit 8: Proportion** | | **Unit 9: Volume and Surface Area** |
| Students will discover what a vector is and how it is used. Students will be able to solve complex grade 9 questions with these skills.  **Keywords for this Unit**  **Vector:** A column containing two numbers that describes a movement in a particular direction | Student will use prior knowledge of proportion and algebra to learn how to find direct and inverse proportion using an algebraic formula.  **Keywords for this Unit**  **Direct Proportion:** The relationship between two quantities whose ratio remains constant. As one variable doubles, so does the other.  **Inverse Proportion:** The relationship between two quantities where as one quantity increase, the other quantity decreases in proportion. e.g. as one variable doubles, the other halves | | This topic consolidates the 4 years learning and understanding of volume and surface area. This topic will develop this further looking at more complex problems.  **Keywords for this Unit**  **Volume:** The amount of 3D space a shape takes up, measured in cubic units  **Surface Area:** The total area of the outside 2D surfaces of a 3D object  **Prism:** A 3D shape, with straight edges and a constant cross-section  **Cylinder:** A 3D shape made of a constant circular cross-section  **Compound shape:** A 3D shape made up of other connected shapes  **Pyramids:** A 3D shape with a square or rectangular base, and triangular faces up to a point  **Cones:** A 3D shape with a circular base, and a curved face up to a point  **Sphere:** A 3D solid that is perfectly round; a ball, where all points on the surface are the same distance from its centre  **Frustum:** A pyramid with the top cut off parallel to the bottom |
| **Unit 10: Iteration** | | **Unit 11: Functions** | |
| Students will discover what iteration is and how to use their calculator to find iteration too.  **Keywords for this Unit**  **Iteration:** Repetition of a procedure to obtain successivelycloser approximations to the solution of a problem. | | Students will recall knowledge of graphs and develop their knowledge by being introduced to functions. Students will use functions to transform different equations.  **Keywords for this Unit**  **Function:** A mathematic relationship from a set of inputs to a set of outputs  **Domain:** The set of all inputs for a function  **Range:** The set of all outputs for a function | |