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| **Subject** | **Year 10 Higher Threshold Concepts – Autumn Term** | **How to support students’ learning** |
| Mathematics | **Data Collection and Sampling**   * Understand terms sampling and bias * Calculate averages and range for ungrouped data in lists, frequency tables and grouped data * Understand the properties of populations or distributions from a sample or summary statistics.   **Organising, Presenting and Analysing Data**   * Draw histograms with equal class widths * Draw histograms with unequal class widths * Interpret data from histograms * Calculate averages from histograms * Draw cumulative frequency graphs * Interpret data from cumulative frequency graphs * Draw box plots * Interpret data from box plots * Compare populations using box plots and cumulative frequency graphs   **Integers and Indices**   * Use standard form with positive and negative indices * Multiply and divide numbers in standard form * Add and subtract numbers in standard form * Use standard form with a calculator   **Algebraic Manipulation**   * Recognise the difference between an equation and an identity, and show algebraic expressions are equivalent. * Create and use formulae and expressions from real-world contexts * Understand the completing the square process * Factorise quadratic expressions * Rearrange formulae to change the subject where the subject appears twice or where a power or reciprocal of the subject appears * Simplify algebraic fractions by factorising into one bracket * Simplify algebraic fractions by factorising into two brackets * Add and subtract algebraic fractions   **Pythagoras and Trigonometry**   * Use Pythagoras' theorem in 3D * Use the exact values of trigonometric ratios * Learn and use trigonometric graphs * Use trigonometry in 3D shapes   **Algebraic Solutions of Equations**   * Factorise to solve quadratic equations * Rearrange and solve quadratic equations by using the completing the square process * Rearrange and solve quadratic equations by using the quadratic formula * Construct and solve quadratic equations * Solving simultaneous equations involving quadratics | * Encourage your child to look at real-life graphs and tables of data * Discuss applications of questionnaires * Encourage your child to have the correct equipment for lessons, e.g. a pencil, ruler, protractor, calculator * Use [www.sparx.com](https://sparxmaths.com/)for support if needed. Teachers will have provided your child with a login and password * Encourage your child to show all their working out. If they have homework online, then encourage them to write down all their working out in their exercise books * Encourage your child to look at real-life graphs and tables of data * Encourage your child to have the correct equipment for lessons, e.g. a pencil, ruler, calculator * Use [www.sparx.com](https://sparxmaths.com/)for support if needed. Teachers will have provided your child with a login and password * Encourage your child to show all their working out. If they have homework online, then encourage them to write down all their working out in their exercise books * Encourage your child to look at real-life examples of standard form numbers, e.g. very small (biological cells) and very large scientific numbers (astronomical weights and distances) * Encourage your child to have the correct equipment for lessons, e.g. a calculator * Use [www.sparx.com](https://sparxmaths.com/)for support if needed. Teachers will have provided your child with a login and password * Encourage your child to show all their working out. If they have homework online, then encourage them to write down all their working out in their exercise books * Encourage your child to practise their algebra skills and factors of numbers * Discuss how to substitute and use real-life formulas, e.g. cooking instructions based on weight * Encourage your child to have the correct equipment for lessons, e.g. a calculator * Use [www.sparx.com](https://sparxmaths.com/)for support if needed. Teachers will have provided your child with a login and password * Encourage your child to show all their working out. If they have homework online, then encourage them to write down all their working out in their exercise books * Encourage your child to look back at their notes and to review Pythagoras’ Theorem * Encourage your child to look back at their notes and to review trigonometric ratios SOHCAHTOA and the special angles * Encourage your child to use the website www.GeoGebra.org to plot functions to see what their graphs look like * Encourage your child to have the correct equipment for lessons, e.g. a pencil, ruler, calculator * Use [www.sparx.com](https://sparxmaths.com/)for support if needed. Teachers will have provided your child with a login and password. * Encourage your child to show all their working out. If they have homework online, then encourage them to write down all their working out in their exercise books * Encourage your child to practise their algebra skills and factors of numbers * Encourage your child to have the correct equipment for lessons, e.g. a calculator * Use [www.sparx.com](https://sparxmaths.com/)for support if needed. Teachers will have provided your child with a login and password * Encourage your child to show all their working out. If they have homework online, then encourage them to write down all their working out in their exercise books |