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| **Subject**  | **Year 10 Foundation Threshold Concepts – Autumn Term**  | **How to support students’ learning**  |
| Mathematics  | **Collecting, Organising, Presenting and Analysing Data*** Understand terms sampling and bias
* Calculate averages and range for ungrouped data in lists and frequency tables
* Find averages from diagrams
* Interpret and construct pie charts
* Calculate averages and range for grouped data in lists and frequency tables
* Interpret and construct line graphs for time series and identify trends
* Understand the properties of populations or distributions from a sample or summary statistics.
* Recognise graphical misrepresentation through incorrect scales, labels etc.

**Primes, Factors and Multiples*** Find the lowest common multiple
* Find the highest common factor
* Find prime numbers
* Perform prime factor decomposition
* Find the highest common factor and lowest common multiple using prime factor decomposition

**Accuracy and Rounding*** Round integers
* Round decimals
* Round integers using significant figures
* Round decimals using significant figures
* Find error intervals

**Algebraic Manipulation** * Simplify expressions
* Expand single brackets
* Expand double brackets
* Recognise and use difference of two squares
* Factorise into one bracket
* Factorise quadratic expressions
* Substitute numbers into expressions and formulae
* Substitute numbers into more complex formulae, including kinematic formulae
* Rearrange formulae to change the subject
* Formulate simple formulae and expressions from real-world contexts.

**Mensuration*** Calculate perimeter
* Calculate area
* Calculate arc lengths and area of a sector
* Calculate surface area and volume of cuboids and other prisms
* Calculate surface area and volume of pyramids, spheres, cones and simple composite shapes
* Use Pythagoras' theorem in 2D
* Apply Pythagoras' theorem in 2D
* Understand the terms sin, cos and tan
* Find unknown sides in right-angled triangles
* Find unknown angles in right-angled triangles

**Graphs*** Find the equation of straight-line graphs graphically
* Find the equation of straight-line graphs from one point and a gradient
* Find the equation of straight-line graphs from two points
* Recognise the shape of different types of non-linear graphs
* Plot simple quadratic functions
* Plot simple polynomial and reciprocal graphs using a table of values
 |  * 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
* 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 learn their times tables, prime numbers below 100 and square numbers up to 225 (152)
* 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 understand the base 10 decimal place value system
* Discuss applications of the base 10 decimal system, e.g. using money
* Discuss with them situations where numbers have been rounded, e.g. football crowds, newspaper headlines
* 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 multiples 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 learn formulas for calculating the areas of basic 2D shapes, e.g. rectangles, triangles, parallelograms, trapeziums
* Discuss 3d shapes in real-life, e.g., smarties tubes are hexagonal prisms, the Egyptian Pyramids
* Encourage your child to look back at their notes and to learn Pythagoras’ Theorem
* Encourage your child to learn the trigonometric ratios SOHCAHTOA and the special angles
* 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 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
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