Subject	Y10 Core Knowledge – Autumn/Spring/Summer term	How to support students' learning
Maths	**Autumn/Spring/Summer term** **Non calculator methods -** 1. Find the highest common factor. 2. Find the lowest common multiple. 3. Find the HCF using prime factor decomposition. 4. Find the LCM using prime factor decomposition. 5. Estimate calculations. 6. Find error intervals. 7. Truncate decimals. 8. Understand error intervals for truncated numbers. 9. Understand calculations with upper and lower bounds. 10. Add mixed numbers. 11. Subtract mixed numbers. 12. Multiply mixed numbers. 13. Divide mixed numbers. 14. Convert fractions to recurring decimals. 15. Convert recurring decimals to fractions. 16. Multiply decimals. 17. Divide decimals. **Working with circles -** 18. Calculate the perimeter of fractional parts of a circle. 19. Calculate length of an arc. 20. Calculate the area of fractional parts of a circle. 21. Calculate area of a sector. 22. the surface area of cylinders. 23. Find the surface area of spheres. 24. Find the surface area of cones. **Compound measures -** 25. Calculate volume of a cylinder. 26. Explore volumes of spheres. 27. Explore volumes of cones. 28. Explore volumes of pyramids. 29. Find the volume of composite shapes. 30. Convert compound units. 31. Mixed problems: Calculating density and pressure. 32. Plot distance-time graphs using speeds. 33. Plot velocity-time graphs. 34. Calculate distances from velocity-time graphs.	• Student can complete independent practice on Dr Frost Maths https://www.drfrost.org/index.php • Dr Frost Maths has topic-based learning with videos to support students and questions available that give automatic feedback to students. • Otherwise, students can also access past papers that can be completed online. • All homework and revision for students will be set on Dr Frost by their class teacher. • **Other useful websites:** Maths Genie (topic based and past papers) https://www.mathsgenie.co.uk/gcse.php • On Maths (online papers) https://www.onmaths.com/

	35. Calculate acceleration from velocity-time graphs. 36. Sketch graphs of water flows. **Data representation -** 37. Calculate with rates. 38. Sketch graphs of water flows. 39. Find and interpret the median from an ungrouped frequency table. 40. Construct stem-and-leaf diagrams. 41. Interpret stem-and-leaf diagrams. 42. Find and interpret the modal class from a grouped frequency table. 43. Estimate the mean from a grouped frequency table. 44. Find which class the median is in. 45. Estimate the median from a grouped frequency table. 46. Construct frequency polygons. 47. Interpret frequency polygons. 48. Compare distributions using charts and measures. 49. Draw time-series graphs. 50. Interpret time-series graphs. **FDP and ratio -** 51. Combine ratios. 52. Change ratios. 53. Explore conversion graphs. 54. Solve problems involving percentages, ratios and fractions. 55. Solve problems with ratio and algebra. **Percentages and interest -** 56. Solve problems with multiple percentage changes. **Indices and standard form -** 57. Estimate roots and powers. 58. Understand and use negative indices. 59. Understand and use fractional indices. 60. Manipulate indices. **Linear algebraic manipulation -** 61. Solve equations with unknowns on both sides. 62. Solve equations with the variable in the denominator. 63. Form algebraic expressions. 64. Form and solve equations. 65. Interpret representations on number lines as inequalities.	

	66. Show solutions to inequalities on a number line. 67. Solve inequalities, including with unknowns on both sides. 68. Solve double sided inequalities. 69. Form and solve inequalities. **Linear graphs and inequalities -** 70. Complete a table of values for a linear graph. 71. Determine whether a point is on a line. 72. Rearrange an equation in the form y = mx + c. 73. State intercepts. 74. Calculate gradients. 75. Understand and use y = mx + c. 76. Find the equation of a line from a graph. 77. Use the equation of a straight-line graph given one point and gradient. 78. Use the equation of a straight-line graph given two points. 79. Find the midpoint of a line segment. 80. Use Pythagoras theorem to calculate the length of a line between two coordinates. 81. Recall and use the relationships between gradients for parallel and perpendicular lines. 82. Find the equations of parallel lines. 83. Find the equations of perpendicular lines. 84. Represent solutions to single inequalities on a graph using lines parallel to the axes. 85. Represent solutions to single inequalities on a graph using straight lines. 86. solutions to multiple inequalities on a graph**.** **Other graphs -** 87. Complete a table of values for non-linear graphs. 88. Draw quadratic graphs. 89. Understand graphs of cubic functions. 90. Factorise quadratic expressions. 91. Factorise the difference of two squares. 92. Solve quadratics by factorising. 93. Factorise harder quadratic expressions. 94. Solve harder quadratics by factorising. 95. Form and solve quadratic equations. 96. Understand and identify turning points of a quadratic graph. 97. Identify and interpret roots and intercepts of quadratics. 98. Solve quadratic equations graphically. 99. Expand triple brackets.	

	Sequences - 100. Describe types of sequences. 101. Find the rule for the nth term of a linear sequence. 102. Find the rule for the nth term of a linear sequence given diagrammatically. 103. Generate linear sequences given an algebraic rule. 104. Check whether a term can be in a sequence algebraically. 105. Check whether a term can be in a sequence by inspection. 106. Generate other sequences given a complex algebraic rule. 107. Solve problems involving geometric sequences. 108. Describe and continue sequences involving surds. 109. Find the rule for the nth term of a quadratic sequence in the from an^2. 110. Find the rule for the nth term of a quadratic sequence in the from an^2+bn. 111. Find the rule for the nth term of a quadratic sequence in the from an^2+bn+c. **Simultaneous equations -** 112. Solve simultaneous equations graphically. 113. Use linear and quadratic graphs to estimate values of y for given values of x. 114. Solve a pair of linear simultaneous equations by adjusting one equation. 115. Solve a pair of linear simultaneous equations by adjusting both equations. 116. Determine whether a given (x,y) is a solution to a pair of linear simultaneous equations. 117. Solve linear simultaneous equations using substitution. 118. Construct and solve simultaneous equations. **Trigonometry -** 119. Use Pythagoras' theorem to calculate a smaller side. 120. Use Pythagoras' theorem to calculate the hypotenuse. 121. Determine whether a triangle is right-angled. 122. Find unknown angles in right-angled triangles. 123. Find unknown sides in right-angled triangles. 124. Know exact values in right-angled triangles. 125. Work with exact values in right angled triangles. 126. Pythagoras’ theorem in 3D.	

	127. Trigonometry in 3D shapes. **Angles and bearings -** 128. Identify and calculate corresponding angles. 129. Identify and calculate alternate angles. 130. Identify and calculate co-interior angles. 131. Use quadrilateral properties to find angles. 132. Combine angle facts. 133. Complete angles problems with algebra. 134. Find and use the angle sum of any polygon. 135. Find exterior angles in a regular polygon. 136. Find interior angles in a regular polygon. 137. Use cardinal directions and related angles. 138. Measure and read bearings. 139. Calculate bearings using angles rules. 140. Make scale drawings using bearings. 141. Solve bearings problems using Pythagoras and trigonometry.	