| Subject | Y8 Threshold Knowledge – Autumn/Spring/Summer term | How to support students' learning |
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| **Maths** | **Autumn/Spring/Summer**<br>**Estimation -**<br>1. Estimating calculations.<br><br>**Percentages -**<br>2. Express one number as a fraction or a percentage of another using a calculator.<br>3. Express one number as a fraction or a percentage of another without a calculator.<br>4. Calculate percentage increase and decrease with a calculator.<br>5. Calculate percentage increase and decrease without a calculator.<br>6. Finding the percentage an amount has been changed by.<br><br>**Expanding and Factorising -**<br>7. Expand a single bracket.<br>8. Expand multiple single brackets and simplify.<br>9. Factorise into a single bracket.<br><br>**Multiplying and Dividing Fractions -**<br>10. Multiply a fraction by an integer.<br>11. Multiplying fractions.<br>12. Multiplying mixed numbers.<br>13. Understand and use the reciprocal.<br>14. Divide a fraction by an integer.<br>15. Dividing fractions.<br>16. Dividing mixed numbers.<br><br>**Proportion -**<br>17. Appreciate that any two numbers can be connected via a multiplicative relationship.<br>18. Be able to calculate the multiplier for any given two numbers.<br>19. Solve problems with direct proportion.<br><br>**Similarity and Enlargement -**<br>20. Understand scale factors as multiplicative representations.<br>21. Work out missing sides and angles in a pair of given similar shapes.<br>22. Explore relationships between similar shapes.<br>23. Draw and interpret scale diagrams.<br>24. Interpret maps using scale factors and ratio.<br>25. Enlarge a shape by a positive integer scale factor.<br>26. Enlarge a shape by a positive integer scale factor from a point. | • Student can complete independent practice on Dr Frost Maths https://www.drfrost.org/index.php<br>• Dr Frost Maths has topic-based learning with videos to support students and questions available that give automatic feedback to students.<br>• Otherwise, students can also access past papers that can be completed online.<br>• All homework and revision for students will be set on Dr Frost by their class teacher.<br>• Other useful websites: Maths Genie (topic based and past papers) https://www.mathsgenie.co.uk/gcse.php<br>• On Maths (online papers) https://www.onmaths.com/ |

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| | 27. Enlarge a shape by a positive fractional scale factor.<br>28. Describe enlargements.<br>29. Identify invariant points and lines.<br><br>**Probability -**<br>30. Understand and use probability phrases.<br>31. Understand and use the probability scale.<br>32. Writing probabilities as fractions, decimals and percentages.<br>33. Listing outcomes.<br>34. Construct sample space diagrams.<br>35. Find probabilities from a sample space diagram.<br>36. Using experimental data to estimate probabilities.<br>37. Understand that increasing the number of trials leads to a more accurate estimate of the theoretical probability.<br>38. Expected outcomes.<br>39. Calculate probability of independent events.<br>40. Use the property that probabilities sum to 1.<br><br>**Ratio and Proportion -**<br>41. Understand the meaning, representation and notation of ratio.<br>42. Comparing ratios as fractions and percentages.<br>43. Express ratios in their simplest integer form.<br>44. Writing ratios in the form 1:n.<br>45. Share a value into a given ratio.<br>46. Solve ratio problems given one amount.<br>47. Combining ratios.<br>48. Solve 'best buy' problems.<br>49. Solve problems with exchange rates.<br><br>**Probability -**<br>50. Construct a two-way table.<br>51. Interpret a two-way table.<br>52. Find probabilities from two-way tables.<br>53. Construct frequency trees.<br>54. Find probabilities from frequency trees.<br>55. Solve problems with frequency trees.<br>56. Use tree diagrams for independent events.<br>57. 5Understand populations and samples.<br><br>**Angles -**<br>58. Properties of 2D shapes.<br>59. Identify polygons up to a decagon.<br>60. Recognise types of triangles.<br>61. Identify perpendicular and parallel lines.<br>62. Use angle and line notation.<br>63. Use cardinal directions and related angles.<br>64. Draw angles.<br>65. Measure angles. | |

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| | 66. Classify angles.<br>67. Use the sum of angles on a straight line.<br>68. Use the sum of angles at a point.<br>69. Apply the sum of angles in a triangle.<br>70. Apply the sum of angles in a quadrilateral.<br>71. Using quadrilateral properties to find angles.<br>72. Find and use the angle sum of any polygon.<br>73. Find interior angles in a regular polygon.<br>74. Find exterior angles in a regular polygon.<br>75. Use the equality of vertically opposite angles.<br>76. Identify and calculate alternate angles.<br>77. Identify and calculate co-interior angles.<br>78. Identify and calculate corresponding angles.<br>79. Combining angle fact.<br>80. Make scale drawings using bearings.<br>81. Measure and read bearings.<br>82. Calculate bearings using angles rules.<br>83. Use the standard conventions for labelling the sides and angles of triangle ABC.<br><br>**Solving and Rearranging -**<br>84. Solve equations with one-step.<br>85. Solve equations with two or more steps.<br>86. Solving equations with the variable in the denominator.<br>87. Form and solve equations.<br>88. Check whether a term can be in a sequence algebraically.<br>89. Angles problems with algebra.<br>90. Changing the subject of a formula.<br><br>**Estimation -**<br>91. Estimating and measuring length, mass and capacity.<br>92. Estimating calculations.<br>93. Estimating roots and powers.<br>94. Determine whether calculations using rounding will give an underestimate or and overestimate.<br>95. Truncating decimals.<br>96. Error intervals for truncated numbers.<br>97. Finding error intervals.<br>98. Calculations with upper and lower bounds.<br><br>**Perimeter and Area -**<br>99. Calculate the perimeter of simple shapes.<br>100. Calculate the perimeter of compound shapes.<br>101. Recognise and label parts of a circle.<br>102. Calculate the circumference of a circle.<br>103. Calculate the perimeter of fractional parts of a circle. | |

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| | 104. Calculate the area of a rectangle.<br>105. Calculate the area of a parallelogram.<br>106. Calculate the area of a triangle.<br>107. Calculate the area of compound shapes.<br>108. Calculate the area of a trapezium.<br>109. Calculate the area of a circle.<br>110. Calculate the area of fractional parts of a circle.<br>111. Convert units of area.<br>112. Identify 3D shapes.<br>113. Properties of 3D shapes.<br>114. Accurate nets of cuboids and other 3-D shapes.<br>115. Finding the surface area of cubes and cuboids.<br>116. Finding the surface area of prisms.<br>117. Finding the surface area of composite shapes.<br>118. Finding the surface area of cylinders.<br>119. Solve problems with pressure, force and area.<br><br>**Interpreting Data -**<br>120. Construct stem-and-leaf diagrams.<br>121. Interpret stem-and-leaf diagrams.<br>122. Compare distributions using charts and measures.<br><br>**Linear Graphs -**<br>123. Work with coordinates in all four quadrants.<br>124. Solve shape problems involving coordinates.<br>125. Find the midpoint of a line segment.<br>126. Recognise, use and draw the lines Y=X, Y=-X.<br>127. Identify and draw lines that are parallel to the axes.<br>128. Complete a table of values for a linear graph.<br>129. Use a graph to represent a multiplicative relationship and connect to other known representations.<br>130. Plot straight line graphs.<br>131. Calculate gradients.<br>132. Understand gradient as the rate of change.<br>133. State intercepts.<br>134. Find the equation of a line from a graph.<br>135. Understand and use y = mx + c.<br>136. Determine whether a point is on a line.<br>137. Rearrange an equation in the form y = mx + c.<br>138. Construct real-life straight-line graphs.<br>139. Finding the equations of real-life straight-line graphs.<br>140. Understand and interpret linear real-life graphs.<br>141. Interpret gradient and intercepts of real-life graphs.<br><br>**Volume -**<br>142. Construct and interpret plans and elevations.<br>143. Volume of cubes and cuboids.<br>144. Find the volume of composite shapes.<br>145. Volume of other prisms. | |

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| | 146. Volume of a cylinder.<br>147. Convert units of volume.<br>148. Solve problems with density, mass and volume.<br><br>**Scatter Graphs and Time Series -**<br>149. Draw and plot points on a scatter graph.<br>150. Draw a line of best fit.<br>151. Understand and describe linear correlation.<br>152. Understand that correlation does not always imply causation.<br>153. Use line of best fit.<br>154. Understand interpolation and extrapolation.<br>155. Interpret information from a scatter graph.<br>156. Draw time-series graphs.<br>157. Interpreting time-series graphs.<br><br>**Transformations and Congruency -**<br>158. Recognise line symmetry.<br>159. Identify the order of rotational symmetry of a shape.<br>160. Rotate a shape.<br>161. Rotate a shape about a point.<br>162. Describe rotation.<br>163. Translate shapes by a given vector.<br>164. Describe translations of shapes.<br>165. Describe translations of shapes using vectors.<br>166. Draw column vectors on a grid.<br>167. Describe paths using column vectors.<br>168. Complete four operations with column vectors.<br>169. Reflect shapes in given lines.<br>170. Reflect shapes in lines given as y=?, x=?<br>171. Reflect shapes in lines given in the form y=mx+c.<br>172. Describe reflection.<br>173. Identify invariant points and lines.<br>174. Combining transformations.<br>175. Understanding congruence.<br>176. Identify congruent triangles.<br>177. Know the criteria for congruence of triangles.<br><br>**Loci and Constructions -**<br>178. Using a pair of compasses.<br>179. Locus equidistant from two points.<br>180. Locus of distance from a point.<br>181. Locus of distance from a straight line/shape.<br>182. Locus of distance from two lines.<br>183. Construct a perpendicular bisector.<br>184. Construct a perpendicular from a point.<br>185. Construct a perpendicular to a point.<br>186. Construct an angle bisector.<br>187. Construct triangles when given SAS and ASA.<br>188. Construct triangles when given SSS. | |

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| | **Proportion -**<br>189. Explore direct proportion graphs.<br>190. Link Y=KX to direct proportion problems.<br>191. Explore conversion graphs.<br>192. Converting time.<br>193. Solve speed, distance and time problems.<br>194. Mixed problems: Calculating density and pressure.<br>195. Convert compound units.<br>196. Plotting distance-time graphs.<br>197. Plotting distance-time graphs using speeds.<br>198. Interpret distance-time graphs.<br>199. Calculating speed from distance-time graphs.<br>200. Calculating with rates.<br>201. Explore inverse proportion graphs.<br>202. Model real-life graphs involving inverse proportion.<br>203. Solve problems with inverse proportion.<br><br>**Pythagoras -**<br>204. Use Pythagoras' theorem to calculate the hypotenuse.<br>205. Use Pythagoras' theorem to calculate a smaller side.<br>206. Determine whether a triangle is right-angled.<br>207. Use Pythagoras theorem to calculate the length of a line between two coordinates.<br>208. Pythagoras' theorem in 3D. | |