

# LEVEL OF LEARNING THRESHOLD GRID Year 8



BOURNEMOUTH SCHOOL  
FOR GIRLS

DEPARTMENT/SUBJECT: MATHEMATICS

Assessment area	Developing	Secure	Excellent
<p><b>NUMBER SKILLS</b></p>	<ul style="list-style-type: none"> <li>• Ordering correctly positive and negative numbers and applying the four operations with some success including BIDMAS.</li> <li>• Understanding and applying estimation and rounding.</li> <li>• Use positive powers of 2 to 10 and roots of numbers up to 100.</li> <li>• Show confidence in finding factors and multiples, HCF and LCM (not necessarily using a formal method).</li> </ul>	<ul style="list-style-type: none"> <li>• Apply the four operations confidently to both positive and negative numbers, including BIDMAS. Also estimate and round accurately.</li> <li>• Long multiplication and Division.</li> <li>• Accurate use of a calculator.</li> <li>• Understand fully positive integer powers and associated real roots (square, cube and higher).</li> <li>• Use index laws for multiplication and division</li> <li>• Understand prime factorisation, and linking this with HCF and LCM.</li> </ul>	<ul style="list-style-type: none"> <li>• Consistently accurate with BIDMAS calculations involving negatives and powers.</li> <li>• Confidently use prime factorisation to find HCF, LCM and square roots.</li> <li>• Use index laws for multiplication and division including negative powers.</li> <li>• Higher use of a calculator e.g. fractions, powers, ANS, brackets, memory.</li> <li>• Long multiplication and Division including decimals.</li> <li>• Fully understand significant figures.</li> </ul>

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<p>FRACTIONS, DECIMALS AND PERCENTAGES</p>	<ul style="list-style-type: none"> <li>• Show confidence in applying the four operations to both proper and improper fractions and decimals.</li> <li>• Solve problems involving percentage change and interpret the solutions.</li> <li>• Compare two quantities using percentages.</li> </ul>	<ul style="list-style-type: none"> <li>• Apply the four operations confidently to both proper and improper fractions and decimals.</li> <li>• Confidently solve problems involving percentage change including original value problems and simple interest.</li> <li>• Compare two or more quantities given as percentages, fractions or decimals.</li> </ul>	<ul style="list-style-type: none"> <li>• Interpret and solve real world percentage and fraction problems, with and without a calculator.</li> <li>• Use multipliers for repeated percentage change.</li> <li>• Solve problems in which percentages, fractions and decimals are interchanged.</li> </ul>
<p>RATIO</p>	<ul style="list-style-type: none"> <li>□ Divide a given quantity into two parts in a given ratio.</li> </ul>	<ul style="list-style-type: none"> <li>• Express the division of a quantity into two parts as a ratio.</li> <li>• Apply ratio to real contexts and problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Interpret and solve real world ratio and proportion problems including comparisons.</li> <li>• Understand unitary method in a range of topics.</li> <li>• Ratios 1:n etc.</li> <li>• Identify when two variables are directly proportional.</li> </ul>

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<p>ALGEBRA</p>	<ul style="list-style-type: none"> <li>• Use a simple algebraic formula.</li> <li>• Rearrange formulae with one step.</li> <li>• Simplify expressions with simple indices and brackets.</li> <li>• Solve two stage equations using a structured balancing method.</li> <li>• Draw a straight line graph from an equation using a table.</li> <li>• Understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math>.</li> <li>• Begin to show an understanding of gradient.</li> <li>• Solve problems using sequences.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a complex algebraic formula.</li> <li>• Rearrange formulae with two steps.</li> <li>• Simplify and expand more complex.</li> <li>• Expressions with indices and brackets, and factorise.</li> <li>• Use balancing method to solve more complex equations including brackets or unknown both sides.</li> <li>• Understand <math>y=mx+c</math> and the meaning of <math>m</math> and <math>c</math>.</li> <li>• Find the midpoint of coordinate pairs from a diagram.</li> <li>• Use trial and improvement.</li> <li>• Solve sequence problems involving <math>n</math>th term.</li> </ul>	<ul style="list-style-type: none"> <li>• Form and use formulae.</li> <li>• Rearrange more complex formulae.</li> <li>• Simplify expressions with more complex indices.</li> <li>• Factorisation with two or more factors, including algebraic.</li> <li>• Solve equations with brackets, letters on both sides, negatives etc.</li> <li>• Draw graphs for <math>ax+by=c</math>.</li> <li>• Find the equation of a straight line from its graph.</li> <li>• Find the midpoint of coordinate pairs without drawing.</li> <li>• Set up and solve sequence problems from a range of starting points e.g. diagrams.</li> </ul>
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<p>SHAPE AND SPACE</p>	<ul style="list-style-type: none"> <li>• Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.</li> <li>• Calculate with angles in polygons.</li> <li>• Use consistently in context the units of mass, length, volume etc.</li> <li>• Convert between metric units.</li> <li>• Use standard units of measure and related concepts in calculations (length, area, volume/capacity, mass, time, money, etc.)</li> <li>• Calculate perimeter and areas of straight-sided and composite shapes and find volume and surface area of cuboids.</li> <li>• Understand symmetry including rotational.</li> <li>• Simple scale drawing e.g. 1cm:1Km.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and use alternate and corresponding angles on parallel lines.</li> <li>• Give reasons for solutions to angle problems.</li> <li>• Know polygon angle sums and use in calculations.</li> <li>• Deal confidently with units of mass, length, volume, time etc.</li> <li>• Calculate circumference and area of a circle.</li> <li>• Draw simple 3D shapes and nets.</li> <li>• Simple plans and elevations e.g. shapes made from cubes.</li> <li>• Simple transformations.</li> <li>• Scale drawings e.g. 1:50.</li> <li>• Use bearings in accurate diagrams.</li> <li>• Metric conversions.</li> <li>• Area &amp; volume.</li> </ul>	<ul style="list-style-type: none"> <li>• Solve angle problems and state full and clear reasons.</li> <li>• Solve problems involving circles including compound shapes, simple sectors.</li> <li>• Know polygon angle sums and use in calculations, justifying decisions with reasons.</li> <li>• More complex 3D shapes and nets e.g. pyramids, compound shapes.</li> <li>• More complex plans and elevations e.g. angled lines such as pyramids.</li> <li>• More complex transformations e.g. reflect in <math>y=x</math>, enlarge about a point.</li> <li>• Use scale drawings to solve problems.</li> <li>• Calculate bearings using angle rules.</li> </ul>
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<p>HANDLING DATA AND PROBABILITY</p>	<ul style="list-style-type: none"> <li>• Understand and use probability for when two or more events happen at the same time by listing possibilities.</li> <li>• Understand that probability of Not is <math>1-p</math>.</li> <li>• Interpret and construct pie charts and stem and leaf diagrams and Venn diagrams.</li> <li>• Interpret, analyse and compare the distributions of data sets through appropriate measures of average (median, mean and mode) and spread (range).</li> <li>• Collect data from secondary sources e.g. Mayfield.</li> <li>• Set up a data collection sheet for primary data.</li> <li>• Take account of extreme data points.</li> </ul>	<ul style="list-style-type: none"> <li>• Find probabilities for two events using a sample space.</li> <li>• Compare experimental and theoretical probability in a range of contexts.</li> <li>• Identify events as mutually exclusive.</li> <li>• Calculate a probability by summing all to one.</li> <li>• Use and interpret scatter graphs and understand correlation.</li> <li>• Choose appropriate diagrams to display data.</li> <li>• Collect data from secondary sources by taking random samples.</li> <li>• Set up a more complex data collection sheet for primary data.</li> <li>• Analyse data from secondary sources e.g. Mayfield.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate and interpret probabilities to solve problems including comparisons.</li> <li>• Identify events as mutually exclusive and use this to make appropriate calculations.</li> <li>• Solve otherwise awkward problems by finding Not and subtracting from 1.</li> <li>• Use secondary data sets, e.g. spreadsheets such as Mayfield, to make own comparisons and draw conclusions.</li> <li>• Set up a more complex data collection sheet for primary data, specifically designed to efficiently compare data.</li> </ul>
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REASONING, INTERPRETING AND COMMUNICATION MATHEMATICALLY	<input type="checkbox"/> Uses minimal levels of communication.	<input type="checkbox"/> Uses appropriate levels of communication.	<input type="checkbox"/> Uses advanced levels of communication.
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