LEVEL OF LEARNING THRESHOLD GRID Year 8

BOURNEMOUTH SCHOOL FOR GIRLS

DEPARTMENT/SUBJECT: MATHEMATICS

Assessment area	Developing	Secure	Excellent
NUMBER SKILLS	• Ordering correctly positive and negative numbers and applying the four operations with some success including BIDMAS. • Understanding and applying estimation and rounding. • Use positive powers of 2 to 10 and roots of numbers up to 100. • Show confidence in finding factors and multiples, HCF and LCM (not necessarily using a formal method).	• Apply the four operations confidently to both positive and negative numbers, including BIDMAS. Also estimate and round accurately. • Long multiplication and Division. • Accurate use of a calculator. • Understand fully positive integer powers and associated real roots (square, cube and higher). • Use index laws for multiplication and division • Understand prime factorisation, and linking this with HCF and LCM.	• Consistently accurate with BIDMAS calculations involving negatives and powers. • Confidently use prime factorisation to find HCF, LCM and square roots. • Use index laws for multiplication and division including negative powers. • Higher use of a calculator e.g. fractions, powers, ANS, brackets, memory. • Long multiplication and Division including decimals. • Fully understand significant figures.

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FRACTIONS, DECIMALS AND PERCENTAGES	• Show confidence in applying the four operations to both proper and improper fractions and decimals. • Solve problems involving percentage change and interpret the solutions. • Compare two quantities using percentages.	• Apply the four operations confidently to both proper and improper fractions and decimals. • Confidently solve problems involving percentage change including original value problems and simple interest. • Compare two or more quantities given as percentages, fractions or decimals.	• Interpret and solve real world percentage and fraction problems, with and without a calculator. • Use multipliers for repeated percentage change. • Solve problems in which percentages, fractions and decimals are interchanged.
RATIO	• Divide a given quantity into two parts in a given ratio.	• Express the division of a quantity into two parts as a ratio. • Apply ratio to real contexts and problems.	• Interpret and solve real world ratio and proportion problems including comparisons. • Understand unitary method in a range of topics. • Ratios 1:n etc. • Identify when two variables are directly proportional.

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ALGEBRA	• Use a simple algebraic formula. • Rearrange formulae with one step. • Simplify expressions with simple indices and brackets. • Solve two stage equations using a structured balancing method. • Draw a straight line graph from an equation using a table. • Begin to show an understanding of gradient. • Solve problems using sequences. • Understand that $y=mx+c$ is the equation of a straight line	• Use a complex algebraic formula. • Rearrange formulae with two steps. • Simplify and expand more complex. • Expressions with indices and brackets, and factorise. • Use balancing method to solve more complex equations including brackets or unknown both sides. • Understand and use lines parallel to the axes, $y = x$ and $y = -x$. • Understand $y=mx+c$ and the meaning of m and c. • Find the midpoint of coordinate pairs from a diagram. • Use trial and improvement. • Solve sequence problems involving nth term.	• Form and use formulae. • Rearrange more complex formulae. • Solve equations with brackets, letters on both sides, negatives etc. • Simplify expressions with more complex indices. • Draw graphs for $ax+by=c$. • Find the equation of a straight line from its graph. • Find the midpoint of coordinate pairs without drawing. • Factorisation with two or more factors, including algebraic. • Set up and solve sequence problems from a range of starting points e.g. diagrams.

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SHAPE AND SPACE	• Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles. • Calculate with angles in polygons. • Use consistently in context the units of mass, length, volume etc. • Convert between metric units. • Use standard units of measure and related concepts in calculations (length, area, volume/capacity, mass, time, money, etc.) • Calculate perimeter and areas of straight-sided and composite shapes and find volume and surface area of cuboids. • Understand symmetry including rotational. • Simple scale drawing e.g. 1cm:1Km.	• Understand and use alternate and corresponding angles on parallel lines. • Give reasons for solutions to angle problems. • Know polygon angle sums and use in calculations. • Deal confidently with units of mass, length, volume, time etc. • Calculate circumference and area of a circle. • Draw simple 3D shapes and nets. • Simple plans and elevations e.g. shapes made from cubes. • Simple transformations. • Scale drawings e.g. 1:50. • Use bearings in accurate diagrams. • Metric conversions. • Area & volume.	• Solve angle problems and state full and clear reasons. • Solve problems involving circles including compound shapes, simple sectors. • Know polygon angle sums and use in calculations, justifying decisions with reasons. • More complex 3D shapes and nets e.g. pyramids, compound shapes. • More complex plans and elevations e.g. angled lines such as pyramids. • More complex transformations e.g. reflect in $y=x$, enlarge about a point. • Use scale drawings to solve problems. • Calculate bearings using angle rules.

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HANDLING DATA AND PROBABILITY	• Understand and use probability for when two or more events happen at the same time by listing possibilities. • Understand that probability of Not is 1-p. • Interpret and construct pie charts and stem and leaf diagrams and Venn diagrams. • Interpret, analyse and compare the distributions of data sets through appropriate measures of average (median, mean and mode) and spread (range). • Collect data from secondary sources e.g. Mayfield. • Set up a data collection sheet for primary data. • Take account of extreme data points.	• Find probabilities for two events using a sample space. • Compare experimental and theoretical probability in a range of contexts. • Identify events as mutually exclusive. • Calculate a probability by summing all to one. • Use and interpret scatter graphs and understand correlation. • Choose appropriate diagrams to display data. • Collect data from secondary sources by taking random samples. • Set up a more complex data collection sheet for primary data. • Analyse data from secondary sources e.g. Mayfield.	• Calculate and interpret probabilities to solve problems including comparisons. • Identify events as mutually exclusive and use this to make appropriate calculations. • Solve otherwise awkward problems by finding Not and subtracting from 1. • Use secondary data sets, e.g. spreadsheets such as Mayfield, to make own comparisons and draw conclusions. • Set up a more complex data collection sheet for primary data, specifically designed to efficiently compare data.
REASONING, INTERPRETING AND COMMUNICATION MATHEMATICALLY	• Uses minimal levels of communication.	• Uses appropriate levels of communication.	• Uses advanced levels of communication.