

Mapping to National guidelines 5 – 14; Levels D to F

INFORMATION HANDLING

Strands

- Collect

- Organise

- Display

	Level D	Level E	Level F	Boardworks Presentation
	<p>By selecting sources of information for tasks, including a questionnaire which allows several responses to each question.</p>	<p>By selecting sources of information for tasks, including</p> <ul style="list-style-type: none"> - practical experiments; - surveys using questionnaires; - sampling using a simple strategy. 	<p>By selecting sources of information for tasks, including:</p> <ul style="list-style-type: none"> - practical experiments: recognise discrete and continuous data; - surveys using structured questionnaires which allow several responses to each question; - sampling using a strategy which avoids bias. 	<p>S1 Collecting and organizing data</p> <ul style="list-style-type: none"> S1.1 Planning a statistical enquiry S1.2 Types of data S1.3 Collecting data S1.6 Sampling
	<p>By using diagrams or tables.</p>	<p>By designing and using diagrams and tables.</p>	<p>By grouping and ordering discrete/continuous data using equal class intervals (approximately six classes) and constructing grouped frequency tables.</p>	<p>S1 Collecting and organizing data</p> <ul style="list-style-type: none"> S1.4 Tally charts and frequency tables S1.5 Grouped frequency tables
	<p>By constructing graphs (bar, line, frequency polygon) and pie charts</p> <ul style="list-style-type: none"> - involving simple fractions or decimals; - involving continuous data which has been grouped. 	<p>By constructing straight line and curved graphs for continuous data where there is a relationship such as direct proportion - travel, temperature, growth graphs.</p> <p>By constructing pie charts of data expressed in percentages. With the aid, where appropriate, of a computer package.</p>	<p>By constructing stem and leaf charts of data.</p> <p>By constructing scattergraphs of data.</p> <p>By constructing pie charts of raw data.</p>	<p>A8 Linear and real-life graphs</p> <ul style="list-style-type: none"> A8.3 Plotting and interpreting real-life graphs A8.4 Conversion graphs A8.5 Distance-time graphs <p>S2 Graphs and charts 1</p> <ul style="list-style-type: none"> S2.1 Pictograms S2.2 Bar charts S2.3 Line graphs S2.4 Pie charts S2.5 Scatter graphs S2.6 Stem-and-leaf diagrams

Strands	Level D	Level E	Level F	Boardworks Presentation
<p>• Interpret</p>	<p>From a range of displays and databases by retrieving information subject to one condition.</p>	<p>From an extended range of displays (diagrams, tables, graphs, pie charts) and databases, retrieving information subject to more than one condition. By describing the main features of a graph so as to show an awareness of the significance of the information. By calculating the average (mean) to compare sets of data.</p>	<p>By retrieving information from a more extended range of displays (including stem and leaf charts/scattergraphs) and databases. By describing correlation in scattergraphs in qualitative terms, e.g. there is a strong positive correlation between shoe size and handspan. By calculating mean, median, mode and range of data sets using non-grouped data.</p>	<p>S2 Graphs and charts 1 S2.1 Pictograms S2.2 Bar charts S2.3 Line graphs S2.4 Pie charts S2.5 Scatter graphs S2.6 Stem-and-leaf diagrams</p>
<p>• Probability</p>			<p>Work with probability: - by listing possible outcomes of simple random events, e.g. 1, 2, 3, 4, 5, 6 from rolling a die numbered from 1 to 6; - by using appropriate words such as highly likely, unlikely, to describe probability of an outcome; - know that probability is a measure of chance between 0 and 1; probability of an impossible event is 0, probability of a certain event is 1; - determine probability of a familiar event (e.g. an ace from a pack of cards), defining probability as number of favourable outcomes/total number of outcomes, where all the outcomes are equally likely.</p>	<p>S5 Probability S5.1 The language of probability S5.2 Calculating simple probabilities S5.6 Experimental probability</p>

NUMBER, MONEY AND MEASUREMENT

Strands

- Range and type of numbers

	Level D	Level E	Level F	Boardworks Presentation
	<p>Work with:</p> <ul style="list-style-type: none"> - whole numbers up to 100 000 (count, order, read/write); - whole numbers up to a million (read/write only); fractions (all previous plus twentieths, fiftieths, hundredths) and equivalences among these and decimals (in applications); - percentages, decimals to 2 places and equivalences among these in applications in money and measurement. 	<p>Work with:</p> <ul style="list-style-type: none"> - negative numbers (e.g. temperature); - all widely used fractions and equivalence among these and decimals (in applications); - decimals to 3 places (practical applications in measurement). 	<p>Work with:</p> <ul style="list-style-type: none"> - integers; - decimals to a required number of places; - an extended range of powers, e.g. cubes and square roots; - scientific notation for large and small numbers (convert numbers into scientific notation and vice versa/recognise calculator displays); - factors including prime factors; - an extended number vocabulary including integer, rational number, recurring decimal, index, factor, sum, difference, product and quotient. 	<p>N1 Whole numbers</p> <ul style="list-style-type: none"> N1.1 Squares, cubes and roots N1.2 Multiples and factors N1.3 Prime numbers N1.4 Prime factor decomposition <p>N2 Integers</p> <ul style="list-style-type: none"> N2.1 Ordering integers N2.2 Adding and subtracting integers N2.3 Using integers in context <p>N3 Decimals and place value</p> <ul style="list-style-type: none"> N3.1 Place value N3.3 Ordering decimals N3.4 Rounding N3.5 Terminating and recurring decimals <p>N4 Using fractions</p> <ul style="list-style-type: none"> N4.1 Fractions of shapes N4.2 Equivalent fractions N4.3 One number as a fraction of another N4.4 Fractions and decimals N4.5 Ordering fractions <p>N6 Percentages</p> <ul style="list-style-type: none"> N6.1 Fractions, decimals and percentages <p>N8 Indices, surds and scientific notation</p> <ul style="list-style-type: none"> N8.1 Index notation N8.5 Scientific notation

Strands	Level D	Level E	Level F	Boardworks Presentation
• Money	Use all UK coins/notes to £20 worth or more, including exchange.	Use relationships between currencies to do simple calculations.		N9 Money
• Add and Subtract	Add and subtract: - mentally for 2 digit whole numbers, beyond in some cases, involving multiples of 10 or 100; - without a calculator, for 4 digits with at most two decimal places (easy examples only); - with a calculator, for 4 digits with at most 2 decimal places; - in applications in number, measurement and money.	Add and subtract: - mentally for 2 digit numbers including decimals; - without a calculator for 4 digits with at most 2 decimal places; - with a calculator for any number of digits with at most 3 decimal places; - in applications in number, measurement and money; - positive and negative numbers in applications such as rise in temperature.	Add and subtract: - mentally for 2 digit numbers including integers; - without a calculator for 4 digit numbers including decimals and integers; - with a calculator for whole numbers, decimals and integers with any number of digits; - in applications in number, measurement and money.	N10 Mental methods N10.2 Addition and subtraction N10.5 Problems and puzzles N11 Written and calculator methods N11.2 Addition and subtraction N11.5 Using a calculator N11.6 Checking results
• Multiply and divide	Multiply and divide: - mentally for whole numbers by single digits; easy examples only; - mentally for 4 digit numbers including decimals by 10 or 100; - without a calculator for 4 digits with at most 2 decimal places by a single digit; - with a calculator for 4 digits with at most 2 decimal places by a whole number with 2 digits; - in applications in number, measurement and money.	Multiply and divide: - mentally for any whole number by a multiple of or 10 or 100 (such as 20 or 200); - mentally for any numbers including decimals by 10, 100, 1000; - without a calculator for 4 digits with at most 2 decimal places by a single digit; - with a calculator for any pair of numbers but at most 3 decimal places in the answer; - in applications in number, measurement and money.	Multiply and divide: - mentally for decimals and integers by a single digit (easy examples only); - without a calculator for more complex examples; - with a calculator for any pair of numbers; - know that multiplication by a number less than one has a decreasing effect whereas division by a number less than one has an increasing effect; - in applications in number, measurement and money.	N10 Mental methods N10.3 Multiplication and division N10.4 Numbers between 0 and 1 N10.5 Problems and puzzles N11 Written and calculator methods N11.1 Estimation and approximation N11.3 Multiplication N11.4 Division N11.5 Using a calculator N11.6 Checking results
• Round numbers	Round any number to the nearest appropriate whole number, ten or hundred.	Round any number to one decimal place.	Round any number: - to a required number of decimal places, e.g. solutions to calculations involving money rounded to 2 decimal places; - to a required number of significant figures, e.g. solutions to calculations of areas/circumferences of circles rounded to 3 significant figures.	N3 Decimals and place value N3.4 Rounding

Strands	Level D	Level E	Level F	Boardworks Presentation
<ul style="list-style-type: none"> Fractions, percentages and ratio 	<p>Work with fractions and percentages: - find simple fractions ($1/7$, $3/4$, $3/5$, $60/100$) of quantities involving at most 4 digits (easy examples only).</p>	<p>Work with fractions and percentages: - mentally find widely used fractions and percentages of whole number quantities; - with a calculator find a fraction or percentage of a quantity; - without a calculator as previously defined. Find ratios between quantities. Use simple unitary ratio.</p>	<p>Work with fractions and percentages: - understand and use equivalences of fractions and ratios, and relate these to decimals and percentages; - use mental, written or calculator methods, as appropriate, to add, subtract, multiply and divide fractions (including mixed numbers) in everyday contexts; - apply percentage increase/decrease in context. Split a quantity in a given ratio. Use direct and inverse proportion in context. Draw/interpret the graph of quantities in direct proportion (straight line through origin).</p>	<p>N5 Calculating with fractions N5.1 Adding and subtracting fractions N5.2 Finding a fraction of a given amount N5.3 Multiplying by fractions N5.4 Dividing by fractions N5.5 Fractions on a calculator</p> <p>N6 Percentages N6.1 Fractions, decimals and percentages N6.2 Finding a percentages of a given quantity N6.3 Finding a percentage change N6.4 Increasing and decreasing by a percentage</p> <p>N7 Ratio and proportion N7.1 Writing and simplifying ratios N7.2 Dividing in a given ratio N7.3 Direct proportion N7.4 Inverse proportion N7.6 Graphs of proportional relationships</p>
<ul style="list-style-type: none"> Patterns and Sequences 	<p>Continue and describe more complex sequences.</p>	<p>Continue and describe sequences: - involving square and triangular numbers; - find specified items in sequences; - prime numbers.</p>		<p>A3 Sequences A3.1 Special number patterns A3.2 Describing and continuing sequences A3.3 Generating sequences from rules</p>

Strands	Level D	Level E	Level F	Boardworks Presentation
<ul style="list-style-type: none"> • Functions and Equations 	<p>Recognise and explain simple relationships:</p> <ul style="list-style-type: none"> - between two sets of numbers or objects. 	<p>Solve simple equations and inequations.</p> <p>Use notation to describe general relationships between 2 sets of numbers.</p> <p>Use and devise simple rules.</p>		<p>A5 Linear equations</p> <p>A5.1 Equations with the unknown on one side</p> <p>A5.2 Equations with the unknown on both sides</p> <p>A5.3 Equations with brackets</p> <p>A5.4 Equations with fractions</p> <p>A7 Inequalities</p> <p>A7.1 Representing inequalities on number lines</p> <p>A7.2 Solving linear inequalities</p> <p>A9 Functions and non-linear graphs</p> <p>A9.1 Function machines</p>
<ul style="list-style-type: none"> • Algebra 			<p>Work with expressions:</p> <ul style="list-style-type: none"> - understand equivalence of expressions and use standard algebraic conventions to rearrange them; - collect like terms; - multiply expressions; - evaluate expressions using the conventions for order of operations in calculations. <p>Solve further equations and inequations.</p> <p>Recognise simple relationships and construct/use simple formulae, equations and graphs (linear) to solve problems.</p>	<p>A1 Introduction to algebra</p> <p>A1.1 Writing expressions</p> <p>A1.2 Collecting like terms</p> <p>A1.3 Multiplying terms and expanding brackets</p> <p>A1.4 Dividing terms</p> <p>A1.5 Factorizing expressions</p> <p>A1.6 Substitution</p> <p>A4 Formulae</p> <p>A4.1 Writing formulae in words and symbols</p> <p>A4.2 Using formulae</p> <p>A4.5 Deriving formulae</p> <p>A5 Linear equations</p> <p>A7 Inequalities</p> <p>A7.3 Inequalities and regions</p> <p>A7.4 Inequalities in two variables</p> <p>A7.5 Real-life problems</p>

Strands	Level D	Level E	Level F	Boardworks Presentation
<ul style="list-style-type: none"> • Measure and estimate 	<p>Measure in standard units:</p> <ul style="list-style-type: none"> - length: small lengths in millimetres; large lengths like building in metres; - weight: extended range of articles, for example own weight; - volume: accuracy extended to small containers in millilitres; 1 l = 1000 ml; - area: right-angled triangles on cm squared grids; - temperature. <p>Estimate small weights, small areas, small volumes in easily handled standard units.</p> <p>Recognise when kilometres are appropriate.</p> <p>Select appropriate measuring devices and units for weight.</p> <p>Be aware of common imperial units in appropriate practical applications.</p>	<p>Measure and draw using standard units:</p> <ul style="list-style-type: none"> - accuracy and device as appropriate to the application. <p>Estimate measurements:</p> <ul style="list-style-type: none"> - areas in square metres; - small lengths in millimetres; - larger lengths in metres. <p>Work with square kilometre, hectare, tonne when appropriate.</p> <p>Read scales on measuring devices including estimating between graduations.</p> <p>Realise that volume can be conserved when shape changes.</p>		<p>M1 Measures</p> <ul style="list-style-type: none"> M1.1 Converting units M1.2 Estimating measurements M1.4 Reading scales
<ul style="list-style-type: none"> • Time 	<p>Work with time:</p> <ul style="list-style-type: none"> - use 24 hour times and equate with 12 hour times; - calculate duration in hours/minutes, mentally if possible; - time activities in seconds with a stopwatch; - calculate speeds (practical activities only). 	<p>Time activities with a digital stopwatch in seconds, tenths, hundredths.</p>	<p>Know and use the relationships between distance, speed and time:</p> <ul style="list-style-type: none"> - in calculations: calculate one given the other two (using appropriate units); - in graphical representations: construct/interpret distance-time graphs. 	<p>M1 Measures</p> <ul style="list-style-type: none"> M1.3 Measuring time <p>A8 Linear and real-life graphs</p> <ul style="list-style-type: none"> A8.5 Distance-time graphs A8.6 Speed-time graphs

Strands	Level D	Level E	Level F	Boardworks Presentation
• Perimeter, formulae, scales	Calculate perimeter of simple straight sided shapes by adding lengths.	Calculate using rules: - areas of rectangles and squares; - volumes of cuboids and cubes. Use scales such as 1 cm to 1, 2, 5 or 10 m: or represented by a ratio such as 1:100 to interpret or draw maps, plans, diagrams; or to make models.	Calculate using rules: - areas of non-right-angled triangles (given the base and height), kite, rhombus, parallelogram and composite shapes; - circumferences/ areas of circles: know and use $C = \pi d$ and $A = \pi r^2$. Use scales: extend to scales represented by ratios such as 1:50 000 widely used in maps.	M4 Perimeter and area M4.1 Perimeter M4.2 Rectangles and compound shapes M4.3 Triangles M4.4 Parallelograms M6 Circles M6.4 Circumference and arc length M6.5 Areas of circles and sectors M8 Scale drawings and similarity M8.2 Scale drawings, maps and plans

SHAPE, POSITION AND MOVEMENT

Strands	Level D	Level E	Level F	Boardworks Presentation
• Range of shapes	Collect, discuss, make and use 3D and 2D shapes: - discuss 3D and 2D shapes referring to faces, edges, vertices, diagonals, sides, angles; - recognise pentagon, hexagon; - identify and name equilateral and isosceles triangles;_ - extend shape vocabulary to radius, diameter, circumference; - create or copy a tiling using a shape template; - make 3D models, solid or skeletal, including using nets: cube and cuboid only; - use the rigidity property of triangles in model making.	Use properties of 2D and 3D shapes: - discuss the side, angle, diagonal properties of quadrilaterals: square, rectangle, rhombus, parallelogram, kite, trapezium; - define and classify quadrilaterals; - relate diameter and circumference (practical work only); - make 3D models, solid or skeletal, including using nets: triangular prism, pyramid, tetrahedron. Draw triangles: - given 3 sides, 2 sides and an included angles, 2 angles and one side; - to scale in applications involving	Draw polygons (four or more sides): - given appropriate information.	M3 2-D shapes M3.1 Classifying triangles M3.2 Constructing triangles M3.3 Classifying quadrilaterals M3.4 Polygons M3.5 Tessellations M5 3-D shapes, surface area and volume M5.1 Describing 3-D shapes M5.2 Drawing 3-D shapes M5.3 Nets M6 Circles M6.1 Naming circle parts

	heights and distances.		
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Strands

- Position and movement

	Level D	Level E	Level F	Boardworks Presentation
	<p>Discuss position and movement:</p> <ul style="list-style-type: none"> - give directions for a route or journey; - use an 8 point compass rose; - use a co-ordinate systems to locate a point on a grid; create patterns by rotating a shape. 	<p>Discuss position and movement:</p> <ul style="list-style-type: none"> - use bearings and distances to produce accurate scale drawings of routes; - use co-ordinates in all four quadrants to plot position; - calculate distances along grid lines. 	<p>Discuss position and movement:</p> <ul style="list-style-type: none"> - enlarge and reduce shapes using any reasonable scale factor e.g. 3, $\frac{1}{2}$; - know and use Pythagoras' theorem; - calculate the direct distance between 2 points on a co-ordinate grid. 	<p>M7 Symmetry and transformations</p> <p>M7.1 Coordinates M7.2 Reflection M7.3 Rotation M7.4 Translation</p> <p>M8 Scale drawings and similarity</p> <p>M8.1 Compass points and bearings M8.3 Enlargement and scale factors</p> <p>M9 Pythagoras' Theorem</p> <p>M9.1 Introducing Pythagoras' Theorem M9.2 Identifying right-angled triangles M9.3 Pythagorean triples M9.4 Finding unknown lengths M9.5 Applying Pythagoras' Theorem in 2-D</p>

Strands	Level D	Level E	Level F	Boardworks Presentation
<ul style="list-style-type: none"> • Symmetry 	<p>Work with symmetry:</p> <ul style="list-style-type: none"> - identify and draw lines of symmetry, generally up to 4; - create symmetrical shapes. 	<p>Work with symmetry:</p> <ul style="list-style-type: none"> - determine whether or not shapes have rotational symmetry; - move a tile of a shape on a squared grid in order to translate, reflect or rotate the shape. 		<p>M7 Symmetry and transformations</p> <ul style="list-style-type: none"> M7.2 Reflection M7.3 Rotation M7.4 Translation M7.5 Reflective symmetry M7.6 Rotational symmetry
<ul style="list-style-type: none"> • Angle 	<p>Angles:</p> <ul style="list-style-type: none"> - draw copy and measure angles accurately within 5°; - use standard notation, 060°, 150°, 300°, to express bearings. 	<p>Angles:</p> <ul style="list-style-type: none"> - use 'reflex' to describe angles; - use the fact that vertically opposite angles are equal; - use the properties of angles formed by a line crossing parallel lines; - know the sum of the angles in a triangle is 2 right angles. 	<p>Angles:</p> <ul style="list-style-type: none"> - use combinations of angle properties; - calculate interior/exterior angles of regular polygons with four or more sides. 	<p>M2 Lines and angles</p> <ul style="list-style-type: none"> M2.2 Angle facts M2.3 Measuring and drawing angles M2.4 Angles and parallel lines M2.5 Angles in a triangle M2.6 Angles in polygons <p>M8 Scale drawings and similarity</p> <ul style="list-style-type: none"> M8.1 Compass points and bearings

Note that problem-solving and enquiry skills are developed throughout all presentations.

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