

**ECCLESTON C.E. PRIMARY SCHOOL**

**MATHEMATICS END POINTS AND**

**KNOWLEDGE**

**By the end of Year 1, our children will;**

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| **Knowledge** | |
| **Number and Place Value** | Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number  Count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s |
| **Addition and Subtraction** | Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs  Represent and use number bonds and related subtraction facts within 20 |
| **Multiplication and Division** | Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher |
| **Fractions** | Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity  Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity |
| **Geometry** | Describe position, direction and movement, including whole, half, quarter and three quarter turns  Recognise and name common 2-D and 3-D shapes, including: ¬ 2-D shapes [for example, rectangles (including squares), circles and triangles] ¬ 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] |
| **Measures** | Know and use language of lengths and heights [for example, long/short, longer/shorter, tall/short, double/half], mass/weight [for example, heavy/light, heavier than, lighter than], capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] and time [for example, quicker, slower, earlier, later]  Recognise and know the value of different denominations of coins and notes  Know and understand the language of time, including: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]  Recognise and use language relating to dates, including days of the week, weeks, months and years  Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times |
| **Skills** | |
| **Number and Place Value** | Given a number, identify 1 more and 1 less  Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least  Read and write numbers from 1 to 20 in numerals and words |
| **Addition and Subtraction** | Add and subtract one-digit and two-digit numbers to 20, including 0  Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9 |
| **Multiplication and Division** | Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher |
| **Fractions** | Find and name a half as 1 of 2 equal parts of an object, shape or quantity  Find and name a quarter as 1 of 4 equal parts of an object, shape or quantity |
| **Geometry** | Make whole, half, quarter and three quarter turns |
| **Measures** | Compare, describe and solve practical problems for: ¬ lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] ¬ mass/weight [for example, heavy/light, heavier than, lighter than] ¬ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] ¬ time [for example, quicker, slower, earlier, later]  Measure and begin to record the following: ¬ lengths and heights ¬ mass/weight ¬ capacity and volume ¬ time (hours, minutes, seconds  Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] |
| **Vocabulary** | |
| Number numeral zero one, two, three … twenty teens numbers, eleven, twelve … twenty twenty-one, twenty-two … one hundred none how many …? count, count (up) to, count on (from, to), count back (from, to) forwards backwards count in ones, twos, fives, tens, equal to, equivalent to, is the same as, more, less, most, least, many, odd, even, multiple of, few, pattern, pair, ones, tens, digit, the same number as, as many, larger, bigger, greater, fewer, smaller, fewest, smallest, least, most, biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third… twentieth last, last but one, before, after, next, between, half-way, between, above, below, estimating, guess, how many ...? nearly, roughly, close to, about the same as, just over, just under, too many, too few, enough, not enough, addition add, more, and make, sum, total, altogether, double, near double, half, halve, how many more to make …? how many more is … than …? how much more is …? Subtract, take away, how many are left/left over? how many have gone? how many fewer is … than …? how much less is …? difference between, equals, is the same as, number bonds/pairs, missing number, multiplication, multiply, multiplied by, multiple, division, dividing, grouping, sharing, doubling, halving, array, number patterns, fraction equal part, equal grouping, equal sharing, parts of a whole, half, one of two equal parts, quarter, one of four equal parts, measure, measurement, size, compare, guess, too much, too little, nearly, close to, about the same as, just over, just under, centimetre, metre, length, height, width, depth, long, short, tall, high, low, wide, narrow, thick, thin, longer, shorter, taller, higher … and so on, longest, shortest, tallest, highest, far, near, close, ruler, metre stick, kilogram, half kilogram, weigh, weighs, balances, heavy, light, heavier than, lighter than, heaviest, lightest, scales, litre, half litre, capacity, volume, full, empty, half full, quarter full, holds, container, time, days of the week, Monday, Tuesday … months of the year (January, February ...) seasons: spring, summer, autumn, winter, day, week, weekend, month, year, birthday, holiday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, earlier, later, next, first, last, midnight, date, now, soon, early, late, quick, quicker, quickest, quickly slow, slower, slowest, slowly, old, older, oldest, new, newer, newest, takes longer, takes less time, how long ago? how long will it be to …? how long will it take to …? how often? always, never, often, sometimes, usually once, twice hour, o’clock, half past, quarter past, quarter to clock, clock face, watch, hands, hour hand, minute hand, hours, minutes, money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change, dear, costs more, cheap, costs less, cheaper, costs the same, as how much …? how many …? total, shape, pattern, flat, curved, straight, round, hollow, solid, sort, make, build, draw, size, bigger, larger, smaller, symmetry, symmetrical, symmetrical pattern, pattern, repeating pattern, match, corner, side point, pointed rectangle (including square), circle, triangle, 3-D shape face, edge, vertex, vertices cube, cuboid, pyramid, sphere, cone , cylinder, position, over, under, underneath, above, below, top, bottom, side on, in, outside, inside, around, in front, behind front, back, beside, next to, opposite, apart, between, middle, edge, centre, corner, direction, journey, left, right, up, down, forwards, backwards, sideways, across, next to, close, near, far, along, through, to, from, towards, away from, movement, slide, roll, turn, stretch, bend, whole turn, half turn, quarter turn, three-quarter turn, count, sort, vote, group, set, list, table, puzzle problem, problem solving, mental, mentally, what could we try next? how did you work it out? explain your thinking, recognise, describe, draw, compare, sort | |

**By the end of Year 3, our children will;**

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| **Knowledge** | |
| **Number and Place Value** | Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number  Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)  Read and write numbers up to 1000 in numerals and in words |
| **Addition and Subtraction** | Add and subtract efficiently, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds |
| **Multiplication and Division** | Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables |
| **Fractions** | Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10  Recognise fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators  Recognise fractions as numbers: unit fractions and non-unit fractions with small denominators  Recognise, using diagrams, equivalent fractions with small denominator |
| **Geometry** | Recognise angles as a property of shape or a description of a turn  Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle  Identify horizontal and vertical lines and pairs of perpendicular and parallel lines  Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). |
| **Measures** | Add and subtract amounts of money to give change, using both £ and p in practical contexts  Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks  Know the number of seconds in a minute and the number of days in each month, year and leap year |
| **Statistics** | Interpret data using bar charts, pictograms and tables solve one-step and two-step questions [for example, ‘How many more?’ and ‘How many fewer?’]  Use information presented in scaled bar charts and pictograms and tables |
| **Skills** | |
| **Number and Place Value** | Compare and order numbers up to 1000  Identify, represent and estimate numbers using different representations  Solve number problems and practical problems involving these ideas |
| **Addition and Subtraction** | Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction  Estimate the answer to a calculation and use inverse operations to check answers  Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction |
| **Multiplication and Division** | Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods  Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects |
| **Fractions** | Find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators  Use fractions as numbers: unit fractions and non-unit fractions with small denominators  Show, using diagrams, equivalent fractions with small denominator  Add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7 ]  Compare and order unit fractions, and fractions with the same denominators  Solve problems that involve all of the above |
| **Geometry** | Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them |
| **Measures** | Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)  Measure the perimeter of simple 2-D shapes  Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o’clock, a.m./p.m., morning, afternoon, noon and midnight  Compare durations of events [for example to calculate the time taken by particular events or tasks] |
| **Statistics** | Present data using bar charts, pictograms and tables solve one-step and two-step questions [for example, ‘How many more?’ and ‘How many fewer?’] |
| **Vocabulary** | |
| As end of Year 1, plus: two hundred – one thousand, threes, fours, hundreds, 100 more/less, one, two, three-digit, place value, stands for, represents, exchange, twenty first etc.., tally, continue, sequence, predict, rule, greater than/less than (<,>), exact, exactly, divide, divided by, divided into, share, equally, one each etc.., group in pairs, threes etc.., equal groups of, row, column, multiplication table, x fact, ÷ fact, equivalent fraction, mixed number, numerator, denominator, two quarters, three quarters, one third, two thirds, one of three equal parts, groups of, time, repeated addition, measuring scale, contains, temperature, degree, further, furthest, fortnight, tape measure, gram, millilitre, 5, 10, 15 minutes past, digital, analogue, clock, watch, timer, seconds, bought, sold, rectangular, circular, triangular, pentagon, hexagon, octagon, surface line, symmetry, route, higher/lower, clockwise, anti-clockwise, explain your method, describe the pattern, describe the rule, investigate, right angle, straight line, mental calculation, written calculation, tally, group, block graph, pictogram, represent, label title, most/least popular, most/least common, show how you.., eights, fifties, hundreds, factor of, relationship, Roman numerals, approximately, factor, round, nearest product, remainder, sixth, seventh, eighth, millimetre, mile, kilometre, centigrade, century, distance apart, between, to, from, perimeter, calendar, earliest, latest, perimeter, am, m, 12hr clock, 24hr clock, pentagonal, hexagonal, octagonal, quadrilateral, right angle, parallel, perpendicular, hemisphere, prism, triangular prism, acute, obtuse, chart, bar chart, frequency, table, Carroll diagram, Venn diagram, axis, axes, compass points, North, South, East, West, NSEW, horizontal, vertical, diagonal, angle, greater/smaller angle, greatest value, least, statement. | |

**By the end of Year 5, our children will;**

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| **Knowledge** | |
| **Number and Place Value** | Read, write, order and compare numbers to at least 1 000 000  Read Roman numerals to 1000 (M) and recognise years written in Roman numerals |
| **Addition and Subtraction** | Add and subtract numbers mentally with increasingly large numbers |
| **Multiplication and Division** | Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers  Multiply and divide numbers mentally drawing upon known facts  Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context  Recognise square numbers and cube numbers, and the notation for squared (2) and cubed (3) |
| **Fractions, Decimals and Percentages** | Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths  Recognise mixed numbers and improper fractions and convert from one form to the other & write mathematical statements > 1 as a mixed number[2/5 + 4/5 = 6/5 = 1 1/5 ]  Read and write decimal numbers as fractions [for example, 0.71 = 71/100]  Recognise thousandths and relate them to tenths, hundredths and decimal equivalents  Read numbers with up to three decimal places  Recognise the percent symbol (%) |
| **Geometry** | Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles  Identify: angles at a point and one whole turn (total 360˚) angles at a point on a straight line & 1/2 a turn (total 180˚) and other multiples of 90˚  Identify and describe the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed |
| **Measures** | Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre & millilitre)  Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints |
| **Statistics** | Read and interpret information in tables, including timetables |
| **Skills** | |
| **Number and Place Value** | Determine the value of each digit count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000  Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero  Solve number problems and practical problems that involve all of the above  Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 |
| **Addition and Subtraction** | Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)  Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy  Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why |
| **Multiplication and Division** | Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers  Establish whether a number up to 100 is prime & recall prime numbers up to 19  Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers  Use square numbers and cube numbers, and the notation for squared (*x*²) and cubed (*x*³)  Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes  Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign  Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.  Multiply and divide whole numbers and those involving decimals by 10, 100 &1000 |
| **Fractions, Decimals and Percentages** | Use thousandths and relate them to tenths, hundredths and decimal equivalents  Write, order & compare numbers with up to three decimal places  Compare and order fractions whose denominators are all multiples of the same number  Add and subtract fractions with the same denominator and denominators that are multiples of the same number  Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams  Round decimals with two decimal places to the nearest whole number and to one decimal place  Solve problems involving number up to three decimal places  Understand that percent relates to ‘number of parts per hundred’, write percentages as a fraction with denominator 100, & as a decimal  Solve problems which require knowing percent & decimal equivalents of 1/2, 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25 |
| **Geometry** | Represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed  Draw given angles, and measure them in degrees (˚)  Use the properties of rectangles to deduce related facts and find missing lengths and angles distinguish between regular and irregular polygons based on reasoning about equal sides and angles |
| **Measures** | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres  Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2 ) and square metres (m2 ) and estimate the area of irregular shapes  Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]  Solve problems involving converting between units of time  Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling |
| **Statistics** | Solve comparison, sum and difference problems using information presented in a line graph  Complete and interpret information in tables, including timetables |
| **Vocabulary** | |
| As end of Year 3, plus: ten thousand, hundred thousand, million, sixes, sevens, nines, twenty-fives, next, consecutive, integer, positive, negative, above/below zero, minus, negative numbers, one thousand more/less, inverse, square, cube, squared, cubed, breadth, hundredths, decimal, decimal fraction, decimal point, decimal place, equivalent, proportion, edge, area, covers, square centimetre (cm²), unit, standard, metric, measuring, cylinder, leap year, millennium, timetable, arrive, depart, noon, date of birth, construct, sketch, centre, angle, right-angled, base, square-based, reflect, reflection, regular, irregular, 2D, two dimensional, oblong, rectilinear, equilateral triangle, isosceles, scalene, cylindrical, tetrahedron, polyhedron, heptagon, parallelogram, rhombus, trapezium, polygon, 3D, three dimensional, spherical, NE, NW, SE, SW, translate, translation, rotate, rotation, degree, reflection, set square, compass, survey, questionnaire, data, justify, make a statement, ≥ greater than or equal to, ≤ less than or equal to, formula, divisibility, square/prime numbers, ascending, descending, order, factor pair, proper/improper fractions, equivalent, reduced to, cancel, square metre (m²), square millimetre (mm²), thousandths, per cent, %, percentage, imperial unit, pint, gallon, currency, discount, radius, diameter, x/y axis, quadrant, congruent, axis of symmetry, reflective symmetry, octahedron, bar-line chart, line graph, maximum/minimum value, outcome, coordinate, protractor, database, explain your reason. | |

**By the end of Year 6, our children will;**

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| **Knowledge** | |
| **Number and Place Value** | Read and write numbers up to 10 000 000 and determine the value of each digit |
| **Addition, Subtraction, Multiplication and Division** | Perform mental calculations, including with mixed operations and large numbers  Identify common factors, common multiples and prime numbers  Use their knowledge of the order of operations to carry out calculations involving the four operations |
| **Fractions, Decimals and Percentages** | Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places  Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts |
| **Geometry** | Recognise that shapes with the same areas can have different perimeters and vice versa  Recognise when it is possible to use formulae for area and volume of shapes  Recognise 3-D shapes, including making nets |
| **Measures** | Read and write standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places |
| **Statistics** | Construct pie charts and line graphs |
| **Algebra** | Use simple formulae  Generate linear number sequences |
| **Ratio and Proportion** | Know and use scale factors  Find missing values |
| **Skills** | |
| **Number and Place Value** | Order and compare numbers up to 10 000 000 and determine the value of each digit  Round any whole number to a required degree of accuracy  Use negative numbers in context, and calculate intervals across zero  Solve number and practical problems that involve rounding, negative numbers or ordering and comparing numbers up to 10 000 000 |
| **Addition, Subtraction, Multiplication and Division** | Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication  Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context  Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context  Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |
| **Fractions, Decimals and Percentages** | Use common factors to simplify fractions; use common multiples to express fractions in the same denomination  Compare and order fractions, including fractions > 1  Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions  Multiply simple pairs of proper fractions, writing the answer in its simplest form. [For example, 1/2 × 1/2 = 1/8]  Divide proper fractions by whole numbers. 1/3 ÷ 2= 1/6  Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [e.g. 3/8]  Multiply one-digit numbers with up to two decimal places by whole numbers  Use written division methods in cases where the answer has up to two decimal places  Solve problems which require answers to be rounded to specified degrees of accuracy  Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples |
| **Geometry** | Calculate the area of parallelograms and triangles  Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3 ) and cubic metres (m3 ), and extending to other units [for example, mm3 and km3 ]  Draw 2-D shapes using given dimensions and angles  Describe and build simple 3-D shapes, including making nets  Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons  Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles  Describe positions on the full coordinate grid (all four quadrants)  Draw and translate simple shapes on the coordinate plane, and reflect them in the axes |
| **Measures** | Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate  Use and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places  Convert between miles and kilometres |
| **Statistics** | Interpret and construct pie charts and line graphs and use these to solve problems  Calculate and interpret the mean as an average |
| **Algebra** | Use simple formulae  Describe linear number sequences  Express missing number problems algebraically  Find pairs of numbers that satisfy an equation with two unknowns  Enumerate possibilities of combinations of two variables |
| **Ratio and Proportion** | Solve problems involving similar shapes where the scale factor is known or can be found  Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts  Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison |
| **Vocabulary** | |
| As end of Year 5, plus: factorise, prime factor, digit total, ration, formulae, equation, unknown, variable, yard, foot, feet, inch, inches, circumference, tonne, pound, ounce, cubic centimetre (cm³), cubic metre (m³), cubic millimetre (mm³), cubic kilometre (km³), Greenwich Mean Time, British Summer Time, International Date Line, profit, loss, kite, arc, net, intersection, dodecahedron, pie chart, mean, mode, median, range, statistics, distribution. | |