**Cortonwood Infant and Nursery School**



Mathematics progression of knowledge and skills across Early Years and Key Stage One

Sep 2022

Progression of knowledge and skills within Mathematics

*Each skill is developed within the specific mathematical domain based on the mathematical knowledge taught at each year groups*

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| Mathematical Domain | Nursery/Smarties (F1)  Children will know how to … | Reception (F2)  Children will know how to…. | Year 1  Children will know how to…. | Year 2  Children will know how to…. | Year 3  Children will know how to…. |
| Counting, Number, Place Value  (Number) | Develop fast recognition of up to 3 objects, without having to count them individually (‘subitising’).  Recite numbers past 5 and say one number for each item in order: 1,2,3,4,5.  Know that the last number reached when counting a small set of objects tells you how many there are in total (‘cardinal principle’).  Show ‘finger numbers’ up to 5 and link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5 and experiment with their own symbols and marks as well as numerals. | Count objects, actions and sounds.  Learn to Subitise.  Link the number symbol (numeral) with its cardinal number value.  Count beyond ten.  Compare numbers.  Practise and improve skills in counting numbers with 1:1 correspondence  Count reliably with numbers.  Place and order numbers.  Use the language of: more than, less than.  Identify and represent numbers using objects and pictorial representations.  Mark, draw and write numbers.  Explore the composition of numbers to 10.  Automatically recall number bonds for numbers 0–5 and some to 10.  Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts. | Place numbers in orders.  Count to and across, forwards and backwards, from 0, 1 or any given number.  Read and write numbers.  Read and write numerals.  Count in multiples of 2s, 5s, 10s  Identify one more and one less than a given number.  Identify and represent numbers using concreate equipment and pictorial representations.  Use language of: equal to, more than, less than (fewer), most, least.  Partition numbers. | Count in steps of 2’s, 3’s and 5’s from 0 and in 10’s from any number – forwards and backwards.  Recognise the value of each digit in two-digit numbers.  Identify, represent and estimate numbers using different concrete and pictorial representations.  Compare and order numbers from using equality symbols.  Read and write numbers in numerals and words.  Solve problems including place value and number facts.  Partition numbers. | Count in multiples of 4, 8, 50 and 100 from 0.  Find 10 or 100 more or less than a given number.  Recognise the place value of each digit in a three-digit number.  Identify, represent and estimate numbers using different representations (concrete and pictorial).  Read and write numbers in numerals and words.  Solve problems including place value.  Begin to partition numbers with up to three-digits. |
| Addition and Subtraction  (Number) | Solve real world mathematical problems with numbers up to 5 and compare quantities using language: ‘more than’, ‘fewer than’. | Represent and use number bonds and related subtraction facts within 10.  Add and subtract one-digit numbers.  Add and subtract one-digit numbers.  Solve practical one-step problems using concrete resources.  Using quantities and objects, they add and subtract 2 single-digit numbers and count on or back to find the answer.  Begin to solve problems including doubling, halving and sharing. | Represent and use number bonds and related subtraction facts within 20.  Add and subtract one digit and two-digit numbers.   Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation.  Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing numbers. | Recall and use addition and subtraction facts fluently, and derive and use related facts up to 100.  Using concrete equipment and pictorial representations, add and subtract numbers including:  A two-digit number and ones  A two-digit number and tens  Add two two-digit numbers  Add three one-digit numbers  Begin to practise strategies for the development of mental calculation (particularly of number bonds)  Recognise and apply the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.  To use concrete and pictorial representations to solve problems including addition and subtraction; quantities and measures. Children will be moving towards a written method. | Mentally add and subtract numbers including:  A three-digit number and ones A three-digit number and tens A three-digit number and hundreds  Use the formal written method of column addition and subtraction to add and subtract numbers with up to three-digits. Children will begin to exchange ones for tens and tens for hundreds using this method.  Estimate the answer to a calculation and use inverse operations to check answers.  Select efficient strategies to solve problems, including missing number problems (i.e.: using number facts, place value, and more complex addition and subtraction). |
| Multiplication and Division  (Numerical Patterns) | Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like ‘pointy’, ‘spotty’, ‘blobs’, etc and Extend and create ABAB patterns – stick, leaf, stick, leaf. | Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.  Continue, copy and create repeating patterns | Count in multiples of 2’s, 5’s and 10’s – identifying patterns.  Understand language of ‘grouping’ and ‘sharing’.  Begin to double and halve quantities with support.  Use concrete equipment and pictorial representations (including arrays) to solve one-step problems involving multiplication and division. | Recall multiplication and division facts for the 2,5 and 10 multiplication tables.  Recall and recognise odd and even numbers – linking them to the multiplication tables.  Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs  Understand and represent that the multiplication of two numbers is commutative and that division by another is not  Solve problems including multiplication and division using a range of concrete and pictorial representations. For example, arrays, repeated addition, mental strategies and known multiplication and division facts | Recall and apply multiplication facts for the 3, 4 and 8 multiplication tables.  Solve problems including missing number problems, involving multiplication and division.  Write and calculate mathematical statements for both multiplication and division using the known multiplication tables, including for two-digit numbers and one-digit numbers.  Use and apply mental methods for multiplication and division, moving towards formal written methods (beginning with expanded method) |
| Fractions  (Numerical Patterns) | N/A | N/A | Recognise, find and name a half as one of two equal parts of an object, shape or quantity.  Recognise, find and name a quarter as being one of four equal parts of an object, shape or quantity.  Combine halves and quarters as parts of a whole.  Write 1/2, ¼ and some ¾ as fractions. | Recognise, find, name and write fractions – 1/3, ¼, 2/4 (½) and ¾ and apply to lengths, shapes, objects or quantities.  Write simple fractions. For example; ½ of 6 = 3.  Recognise the equivalence of 2/4 and ½.  Apply the language of grouping and sharing when finding fractions of amounts . | Count up and down in tenths; recognising that tenths arise from diving an object into 10 equal parts.  Divide one-digit numbers or quantities by 10.  Recognise, find and write fractions as a discrete set of objects: unit fractions and non-unit fractions with small denominators.  Recognise and use fractions as numbers, including where they sit on a number line. |
| Measurement | Make comparisons between objects relating to size, length, weight and capacity and select shapes appropriately  Notice and correct an error in a repeating pattern and begin to describe a sequence of events, real or fictional, using words such as ‘first’, ‘then... | Compare length, weight and capacity | Measure and begin to record lengths/height, mass/weight, capacity/volume, time (seconds, minutes and hours).  Compare, describe and solve practical problems (including using the correct vocabulary) for:  **Length/height** (*long/short, taller/shorter, double/half*).  **Mass/weight** (*heavy/light, heavier, lighter)*  **Capacity/volume:** (*full/empty, more than, less than, half full, quarter)*  Recognise and know the value of different denominations of coins and notes.  Sequence events in chronological order using language of *before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.*  Recognise and use language relating to dates (days of the week, weeks, months and years) .  Read and draw the time to the hour and half past the hour **Time:**  (*quicker, slower, earlier, later).* | Recognise and use the symbols for pounds (£) and pence (p).  Combine pounds and pence to make a given value.  Recognise and find combinations of coins that equal the same amount of money.  Solve problems in practical contexts involving the addition and subtraction of money of the same unit, including giving change.  Compare and order lengths, mass, volume/capacity and record the results using equality symbols.  Compare and sequence intervals of time.  Read and write the time to 5-minute intervals including quarter past/to the hour.  Recall the number of minutes in an hour and the number of hours in a day.  Choose and use an appropriate standard unit to estimate and measure length/height in any direction (cm/m); mass (g/kg); temperature(c); capacity (ml/l) to the nearest appropriate unit – using rulers, thermometers and measuring vessels. | Add and subtract amounts of money to give change; using both pounds and pence, in practical contexts. Children must use the correct units (£) (p).  Measure the perimeter of a 2-D shapes; writing out an appropriate calculation.  Record and compare times in seconds, minutes and hours.  Use vocabulary such as o’clock, a.m., p.m., morning, afternoon, noon and midnight.  Recall the number of seconds in a minute and days in each month, year and leap year.  Compare durations of events.  Measure, compare, add and subtract measurements: lengths, mass, volume/capacity, including the use of the appropriate units (mm/cm/m, g/kg, ml/l). |
| Geometry (properties of shape) | Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cube, cone and sphere) using informal and mathematical language: ‘sides’, ‘corners’; ‘straight’, ‘flat’, ‘round’. | Select, rotate and manipulate shapes to develop spatial reasoning skills.  Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. | Recognise and name common 2-D shapes including rectangles, squares, circles and triangles.  Recognise and name common 3-D shapes including: cubes, cuboids, pyramids and spheres.  Recognise the common 2-D and 3-D shapes in different orientations.  Recognise the similarities and differences between common 2-D and 3-D shapes. | Identify and describe the properties of 2-D shapes, including the number if sides and vertical/horizontal lines of symmetry .  Identify and describe the properties of 3-D shapes including the number of edges, vertices and faces.  Identify 2-D shapes on the surface of 3-D shapes.  Compare and sort common 2-D and 3-D shapes and everyday objects.  Read shape names (suitable for their word reading and spelling).  Draw lines and shapes using rulers. | Draw 2-D shapes and make 3-D shapes using modelling materials.  Recognise and describe 3-D shapes in different orientations.  Recognise angles as a property of shape or description of turn.  Identify right-angles, recognise that two right-angles make a half-turn, three make three quarters of a turn and four make a complete turn.  Identify whether angles are greater than or less than a right-angle.  Identify and name horizontal and vertical lines.  Identify and name pairs of parallel and perpendicular lines.  Understand symmetrical and non-symmetrical polygons and polyhedral.  Use vocabulary such as obtuse and acute to describe angles.  Connect decimals and rounding to drawing and measuring straight lines. |
| Geometry (position and direction) | Understand position through words alone – for example, “The bag is under the table,” – with no pointing and describe a familiar route and Discuss routes and locations, using words like ‘in front of’ and ‘behind’. | Select, rotate and manipulate shapes to develop spatial reasoning skills. | Describe position and movement including language of: whole, half, quarter and three-quarter turns. Make connections between turns and movement on a clockface.  Use language of left, right, top, bottom, on top of, in front of, above, between, around, near, close, far, up, down, forwards, backwards, inside and outside. | Order and arrange combinations of mathematical objects (counters, cubes) in patterns and sequences.  Recognise and recall patterns and sequences.  Continue given sequences; using the recognised pattern.  Recognise patterns in different orientations.  Use mathematical language to describe position, direction and movement in a straight line.  Distinguish between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns.  Use language of clockwise and anti-clockwise). | N/A |
| Statistics | N/A | N/A | N/A | Read and interpret simple pictograms, tally charts, block diagrams and simple tables.  Understand how to read a given key.  Construct simple pictograms, tally charts, block diagrams and simple tables.  Ask and answer simple questions by counting the number of objects in each category and sort categories by quantity.  Ask and answer questions about totalling and comparing categorical data. | Interpret and present data using bar charts, pictograms and tables.  Solve one-step and two-step problems including comparison, sum and difference using information presented in scaled bar charts, pictograms and tables. |

**Year 1 small steps**

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| Place value within 10 | Addition and subtraction within 10 | Shape |
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| Place value within 20 -50 | Addition and subtraction within 20 | length and height |
|  |  |  |
| Place Value within 100 |  |
|  |
| Multiplication and division | Fractions | Weight and volume |
|  |  |  |
| Place value to 100 | Time | Position and Direction |
|  |  |  |
| Money |  |  |
|  |  |  |

**Year 2 small steps**

|  |  |  |
| --- | --- | --- |
| Place value within 100 | Addition and subtraction | Money |
|  |  |  |
| Multiplication and division | Statistics | length and height |
|  |  |  |
| Shape | Fractions | Weight and volume |
|  |  |  |
|  | Time | Position and Direction |
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Smarties and F1

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| --- | --- | --- | --- | --- | --- |
| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Number rhymes and actions to 5.  Counting forwards and backwards 0-5 | Recognise and compose numbers 1-5 and link the number to the corresponding shape  Subitising  Explore numbers in the environment  . | Composition of numbers to 5 using a variety of concrete materials  Counting a quantity from a larger group  Biggest and smallest  More and less  Shapes – circle, square, triangle, rectangle and pentagon  Introduce the number line | Shapes in the environment  patterns – AB  Patterns – descriptive language e.g. spotty stripy  Prepositions  opposites | Introduce number 6  Part, part whole model – with concrete materials numbers 2-5  Matching patterns  Size - order 3 objects and use mathematical language to describe  3D shapes – Cone, cube and sphere. | Describe a familiar route  Sequential langue – first, second, next and last.  3D shapes in the environment+  Consolidation time |
| Ongoing daily:  Revisit numbers daily  Register Maths – weather, day of the week, seasons, shape and number | | | | | |

Reception

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Regonise and compose numbers 0-5 (numerals)  Verbal counting 0-15  Represent numbers to 5  Compare numbers to 5  Recognise, match and sort objects  compare amounts and subitise to 5 | Recognise and compose numbers 0-10 (numerals) 1-8  Verbal counting 0-20  Represent number 6-10  Compare numbers 6-10  compare amounts and subitise to 5  Combine two amounts  making pairs  Shape – patterns and repeated patterns | Counting forwards and backwards from a given number, forwards within 20, backwards within 10. Stopping at a given number  Verbal counting 0-20, 10-0  Bonds to 5  Addition/subtraction= combine 2 groups to make a total and removing a given amount from one group.  Missing number to 10 alongside greater than, less than, the same as  1 more, 1 less to 10  Doubling | 2D and 3D shapes  Addition/subtraction= combine 2 groups to make a total and removing a given amount from one group. (add and subtract within 10)  Addition part-part whole 0-10  Comparing number to 10  recall bonds to 5  Bonds to 10  Halving numbers within 10  Odds and evens within 10  Verbal counting 1-30, 15-0 | Addition/subtraction= combine 2 groups to make a total and removing a given amount from one group, applying recall skills of bonds to 5 (add and subtract within 10)  Recall bonds to 10  Recall number facts 0-5 (bar models)  Verbal counting 1-40, 20-0  Recall and develop bond knowledge to 10  Length and height- comparing  Capacity-comparing capacity and mass | 2D and 3D shapes/ manipulation  Verbal counting 1-50, 20-0- stopping and starting at a given number.  Bonds to 10  Sharing equally between groups.  Recognise and compose numbers 0-10  depending understanding patterns and relationship. |
| On going daily:  Time  Days of the week, seasons and sequencing  2D and 3D shape | | | | | |

Year 1

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| --- | --- | --- | --- | --- | --- |
| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Number: Place Value (within 10)  Number: Addition and Subtraction (within 10) | Number: Addition and Subtraction (within 10)  Geometry: Shape | Number: Place Value (within 20)  Number: Addition and Subtraction (within 20)  Number: Place Value (within 50) (Multiplies of 2,5,and 10 included) | Number: Place Value (within 50) (Multiplies of 2,5,and 10 included)  Measurement: Length and Height  Measurement: Weight and Volume | Number: Multiplication and Division (Reinforce multiplies of 2.5 and 10 included)  Number: Fractions  Geometry: Position and Direction | Number: Place Value (within 100)  Measurement: Money  Measurement: Time |

Year 2

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| --- | --- | --- | --- | --- | --- |
| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Number: Place Value (within 100)  Number: Addition and Subtraction (within 100) | Number: Addition and Subtraction (within 100)  Geometry: Properties of Shape | Measurement: Money  Number: Multiplication and Division | Measurement: Length and Height  Measurement: Mass, Capacity and Temperature | Number: Fractions  Measurement: Time | Statistics  Geometry: Position and Direction |