



## Mathematics - Rationale

In Maths, we aim to enable our pupils to develop skills and knowledge to help them make sense of the world around them. At Priory Woods, Maths is about exploring, mastering skills in counting and developing an understanding of number. It involves exploring shape and pattern, and measurement through activities which contextualise the skills and knowledge. Mathematics is about developing a curiosity in the world around us, and offering solutions to problems. It is also functional, aiming to develop skills which will enable greater independence as our learners grow.

This Mathematics Curriculum has been written with a number of principles in mind:

- ✚ The importance of 'stage not age'. In order to personalise learning and maximise opportunities for progress, it is not the age of the student that is significant but the stage at which they are currently working. Whilst the learning opportunities will change and progress throughout the school, the principle of delivering at a level appropriate to the student's level of development is of paramount importance. To ensure progression of content, it would be expected that the content of the lessons would reflect this difference. For example, sorting teddies in lower could be replaced by sorting pop stars in upper.
- ✚ The understanding that Maths is not confined to a Maths lesson on the timetable but is regarded as a subject with many cross curricular opportunities.
- ✚ The understanding that the teaching of Maths is enhanced by advancements and developments in ICT and augmentative communication aids.

This document is not considered to be a definitive resource, as resources, teaching techniques, research and technology will continue to influence how and what we teach.

# Mathematics

## Number

### Using and Applying included in number and S,S,M

Performance Indicator	Range, context and curriculum opportunities
<p><b>P1- P3</b> Refer to Sensory Curriculum For EYFS also refer to Development Matter: Understand the world: Technology</p>	<p>Refer to sensory curriculum.</p>
<p>P4/5</p> <ul style="list-style-type: none"> <li>• Begin to show an awareness of number activities and counting (P4), respond and join in with the number rhymes (P5).</li> <li>• Begin to follow a sequence as indicated by an adult.</li> <li>• Develop an awareness of number names through their enjoyment of action rhymes and songs that relate to their experience of numbers.</li> <li>• Recite some number names in sequence.</li> <li>• Pupils begin to indicate one or two through various ways of communication, such as gestures, blinking etc.</li> <li>• Pupils make sets that have the same small number of objects.</li> </ul>	<ul style="list-style-type: none"> <li>* Talk about what you are doing and what is happening around them.</li> <li>* Play games such as peek-a-boo (L.S)</li> <li>*Counting using the jabadeo rope.</li> <li>*Parachute games.</li> <li>*Use 'tidy up time' to promote logic and reasoning about where things fit or are kept, use photographs, silhouettes or makaton symbols as labels.</li> <li>*Provide a small group of the same objects in a treasure basket, as well as single items.</li> <li>*Move to the rhythm patterns in familiar number songs and rhymes, clap and tap along to the beat.</li> <li>*Provide collections of interesting objects that can be sorted and matched in various ways.</li> <li>*Begin to introduce numicon- allow pupils to explore with numicon using play dough, water, sand, filling the board, etc. See numicon files for more information.</li> <li>*Outdoor maths- counting and collecting objects outside- leaves, sticks etc.</li> </ul>

<p>P6/7</p> <ul style="list-style-type: none"> <li>● Pupils will recognise numerals to 2 (P6) to 5 (P7).</li> <li>● Pupils will rote count to 5 (P6), to 10 (P7).</li> <li>● Begin to use numbers up to 5 in familiar activities and number rhymes.</li> <li>● Sort materials and objects according to a given criteria.</li> <li>● Identifying odd ones out (P7)</li> <li>● Match and compare the number of objects in two sets.</li> <li>● Estimate how many objects they can see and check by counting them.</li> <li>● Begin to count beyond 10 (P7)</li> <li>● Count reliably up to 10 everyday objects (P7)</li> </ul>	<ul style="list-style-type: none"> <li>*Play games relating to number order.</li> <li>*Provide props for children to act out counting songs and rhymes.</li> <li>*Make number lines available for reference and encourage children to use them in their own play.</li> <li>*Encourage children to make links between cardinal numbers [ quantity] and ordinal numbers [position].</li> <li>*Help children to organise their ideas by talking to them about what they are doing.</li> <li>*Involve counting in everyday situations- such as encouraging the children to count the buttons on their coat, count the cups at break times, etc.</li> <li>* Use tactile number cards.</li> <li>*Use numicon to count to 10, to order, to match and compare, etc. See numicon files for more information.</li> <li>* Encourage children to extend and solve problems in play areas such as construction, sand and water, eg. How many bricks to make tower? Sharing out building bricks.</li> <li>*Use real money to encourage pupils to begin to identify coins.</li> <li>*Count 1p coins to 10, and beyond (P7)</li> <li>*Role play- class shops, and visits to the local shop.</li> <li>*Sorting and ordering- use objects such as counters, and real life resources, such as coins.</li> <li>*Outdoor maths- counting and collecting objects outside- leaves, sticks.</li> </ul>
<p>P8</p> <ul style="list-style-type: none"> <li>● To rote count beyond 10.</li> <li>● Use the vocabulary of positioning, such as first, second, third.</li> <li>● Pupils will recognise numerals from 1-9, in a random order.</li> <li>● To estimate a small number.</li> <li>● Pupils will add and take away one from numbers to 10.</li> <li>● Pupils to use their knowledge and understanding of counting to 10 to solve simple problems.</li> </ul>	<ul style="list-style-type: none"> <li>*Play games relating to number order, addition and subtraction, such as hopscotch, skittles.</li> <li>* Use numicon and number cards to order numbers, count, compare and to begin simple calculation. See numicon files for more information.</li> <li>*feely bags – numbers in bag pupils to identify and place in correct order.</li> <li>*Ask pupils to count objects in a line and in a cluster, encouraging pupils to understand that the number of objects still remains the same.</li> <li>*using tangible objects, e.g “I have ten people coming to a party show me the</li> </ul>

<ul style="list-style-type: none"> <li>• Pupils begin working with money, recognising 1p and 2p coins.</li> </ul>	<p>right amount of cups/plates etc I need”.</p> <ul style="list-style-type: none"> <li>*money problems – e.g. “a bag of sweets cost 6p, how many 1p’s will I need?”</li> <li>*Role play- class shops, and visits to the local shop.</li> <li>* tes iboard for estimation games.</li> <li>* pupils to take part in a race to understand positioning such as 1st, 2nd, 3rd etc</li> <li>*Use I.C.T games and resources relating to number- Education City, Espresso, RM easi maths, interactive whiteboard.</li> <li>*Display interesting books and displays about number and calculation.</li> <li>*Outdoor maths- counting and collecting objects outside- leaves, sticks etc. Use the number stones and tree stumps to order numerals.</li> </ul>
<p><u>Interim Pre KS1 Standards</u></p> <ul style="list-style-type: none"> <li>• -The pupil can demonstrate an understanding of place value of 10s and 1s in a two digit number, using resources to support them if necessary (e.g. representing a two digit number using resources for tens and ones; comparing two numbers up to 20 to identify the larger and smaller number without apparatus).</li> <li>• -The pupil can count forwards and back from 0 to 20, understanding that numbers increase and decrease in size and identify a number that is one more or one less than a given number (e.g. identify missing numbers on a number scale from 0 to 20).</li> <li>• -The pupil can read and write numerals from 0 to 9 and demonstrate an understanding of the mathematical symbols of, add, subtract and equal to. --The pupil can use number bonds from 1 to 5 (e.g. partitioning the number 5 as 0+5, 1+4, 2+3, 3 + 2, 4 + 1, 5 + 0; use concrete objects to demonstrate the commutative law and inverse relationships involving addition and subtraction e.g. <math>3 + 2 = 5</math>, therefore <math>2 + 3 = 5</math> and <math>5 - 3 = 2</math> and <math>5 - 2 = 3</math>).</li> <li>• -The pupil can solve problems involving the addition and subtraction of single digit numbers up to 10.</li> <li>• -The pupil can put up to 20 items into groups of 2 or 5 or into 2 or 5</li> </ul>	<p>See context from P8 and Y1 Expectations</p>

<p>equal groups (e.g. give the pupil 5 hoops and 15 objects and ask them to share them equally between the hoops).</p>	
<p><u>Y1 Expectations</u></p> <ul style="list-style-type: none"> <li>• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>• count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s</li> <li>• given a number, identify 1 more and 1 less</li> <li>• 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</li> <li>• Read and write numbers from 1 to 20 in numerals and words.</li> <li>• Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> </ul> <p>Represent and use number bonds and related subtraction facts within 20</p> <ul style="list-style-type: none"> <li>• Add and subtract one-digit and two-digit numbers to 20, including 0</li> <li>• Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = ? - 9</math></li> <li>• 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</li> <li>• recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity</li> <li>• recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity</li> </ul>	<ul style="list-style-type: none"> <li>*Use numicon and number cards to order numbers.</li> <li>*Count objects in practical, real-life settings. For example- how many balls are in the bag, how many sweets are in the tin, etc.</li> <li>*Ask pupils to count objects in a line and in a cluster, to encourage pupils to understand that the number of objects still remains the same.</li> <li>*Learn number names only when pupils are confident with patterns and counting. Use the interactive whiteboard for dotted numbers for practice with writing numerals.</li> <li>*Use numicon number lines to count forward and backwards.</li> <li>*Use washing pegs to order numbers- include numicon.</li> <li>*Use the number square on the interactive whiteboard and give students their own to learn to count 2's, 5's and 10's. Include money- counting a pile of 2p, 5p and 10p coins.</li> <li>*Use numicon or pegs to double numbers.</li> <li>*Use I.C.T resources such as espresso, education city and RM easi maths. RM easi maths will also track pupil's progression.</li> <li>*Use number lines and numicon to model to the students counting on. Allow students time to work with these resources to understand the concept themselves.</li> <li>*Use counting on or take away strategies for finding differences between two numbers- numicon and Number line.</li> <li>*Give students real life problem worksheets- Primary resources, TES, Problem solving quiz cards (maths cupboard). Entry Level Papers- all related to problem solving.</li> <li>*Identify money (use real coins).</li> </ul>

	<p>*Add small denominations of money together- practical activities using numicon (See numicon File). Money worksheets- primary resources, SEN Teacher, Maths File.</p> <p>*Take students shopping- real life problems. Ask them if they have enough money to buy particular items, ask them to add two items together (small denominations).</p> <p>*Use I.C.T games and resources relating to number- Education City, Espresso, RM easi maths, interactive whiteboard.</p> <p>*Outdoor maths- basic addition and subtraction using natural resources outside, such as leaves, sticks, flowers etc.</p>
<p><u>Y2 Expectations</u></p> <ul style="list-style-type: none"> <li>• count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward</li> <li>• recognise the place value of each digit in a two-digit number (10s, 1s)</li> <li>• identify, represent and estimate numbers using different representations, including the number line</li> <li>• compare and order numbers from 0 up to 100; use &lt;, &gt; and = signs</li> <li>• read and write numbers to at least 100 in numerals and in words</li> <li>• use place value and number facts to solve problems</li> <li>• solve problems with addition and subtraction:</li> <li>• using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>• applying their increasing knowledge of mental and written methods</li> <li>• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</li> <li>• add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</li> <li>• a two-digit number and 1s</li> <li>• a two-digit number and 10s</li> <li>• 2 two-digit numbers</li> </ul>	<p>*Use appropriate worksheets for work on number and calculation- there are worksheets located in the upper school maths room. Good websites for worksheets: SEN teacher, U R Brainy, Primary Resources, TES, scofield and sims.</p> <p>*Odd and even numbers: numicon, two times table, cubes, counters, etc.</p> <p>*Half and quarter items, such as shapes, food etc.</p> <p>*Halving, quartering and doubling numbers- worksheets, use of cubes, counters, etc.</p> <p>*Use I.C.T games and resources relating to number- Education City, Espresso, RM easi maths, interactive whiteboard.</p> <p>*Use Entry Level Maths papers and coursework (KS4)</p> <p>See head of Maths if we have any pupils working at this level.</p>

- adding 3 one-digit numbers
- show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signs
- show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
- recognise, find, name and write fractions, and of a length, shape, set of objects or quantity
- write simple fractions, for example half of 6 = 3 and recognise the equivalence of two quarters and a half.
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# Mathematics

## Measurement

Performance Indicator	Range, context and curriculum opportunities
<p><b>P1- P3</b> Refer to Sensory Curriculum For EYFS also refer to Development Matter: Understand the world: Technology</p>	
<p>P4/5</p> <ul style="list-style-type: none"> <li>● Pupils begin to search for objects that have gone out of sight.</li> <li>● Begin to work on sizes of objects: recognising the difference between the sizes of two objects.</li> <li>● Pupils begin to stack objects and join objects together.</li> <li>● Pupils places objects in and out of containers, according to target shape.</li> <li>● To compare the difference between large and small objects (P5)</li> <li>● Enjoy filling and emptying containers.</li> <li>● Begin to create basic patterns- mark make.</li> </ul>	<ul style="list-style-type: none"> <li>* Provide a range of objects of various textures and weights in treasure baskets.</li> <li>* Encourage exploration of the characteristics of objects e.g. Rolling a ball, lying on top of ball while it's being rolled. Explore objects changing shape when manipulated e.g. Sponges being squeezed.</li> <li>* Use story props to support number rhymes and story with real objects.</li> <li>* Use bodies to explore shape- dancing/art/music.</li> <li>* Outdoor maths- use sticks, stones and leaves to work on sizes of objects, comparing objects and to create arrangements (patterns)</li> <li>* Use puzzles, differentiated to pupil's ability levels.</li> <li>*Water play/sand play- use different sized containers/funnels, etc.</li> </ul>
<p>P6/7</p> <ul style="list-style-type: none"> <li>● Recognise big and small objects in meaningful contexts.</li> <li>● Can manipulate 3d shapes- putting them into a sorter.</li> <li>● Sorts two sets of objects.</li> <li>● Associate a sequence of actions with daily routines.</li> <li>● Begins to work on the difference between heavy and light (P7)</li> <li>● To begin to understand 'bigger than' and 'enough'.</li> <li>● Understand some language about immediate, past and future eg. before, later or soon.</li> <li>● Use everyday language related to time.</li> </ul>	<ul style="list-style-type: none"> <li>* Provide a range of objects of various sizes, shapes, lengths, weights etc in treasure baskets.</li> <li>* Use shape sorters to manipulate 3d shapes.</li> <li>*Numicon pattern overlays- to manipulate irregular 2d shapes.</li> <li>* Use bodies to explore shape- dancing/art/music.</li> <li>*Provide daily routine cards to order their routine (no more than 3-4 cards at P6/7)</li> <li>*Hide objects in the playground for children to find- different sizes, shapes etc.</li> <li>* Use hoops to order shape, size, colour, etc.</li> <li>* Use numicon, paint, counters and beads to create simple patterns.</li> </ul>



<ul style="list-style-type: none"> <li>• Order and sequence familiar events.</li> <li>• Copy and identify simple patterns.</li> </ul>	<ul style="list-style-type: none"> <li>* Outdoor maths- use the metre sticks to find bigger and smaller objects, such as leaves, play equipment, etc.</li> </ul>
<p>P8</p> <ul style="list-style-type: none"> <li>• Identify simple shapes and patterns in pictures.</li> <li>• Begin to talk about the shapes of everyday objects.</li> <li>• Match some shapes by recognising similarities and orientation.</li> <li>• Begin to use mathematical names and terms for 'solid' 3D shapes and 'flat' 2D shapes.</li> <li>• Show an awareness of symmetry.</li> <li>• Find items from positional or directional cues and uses positional language.</li> <li>• Respond to mathematical vocabulary relating to shape, space and measures.</li> <li>• Recognise structure in the day and order their daily routine.</li> <li>• Order days of the week.</li> <li>• Order items by length, height, weight or capacity.</li> </ul>	<ul style="list-style-type: none"> <li>* Use numicon, paint, counters and beads to identify and create patterns.</li> <li>* Encourage pupils to create their own patterns in art, music and dance.</li> <li>*Outdoor maths- identify patterns outside and recreate them.</li> <li>* Use bodies to explore shape- dancing/art/music.</li> <li>* Provide opportunities for pupils to measure time –sand timer, weight – balances and measure –non standard units.</li> <li>* Sort coins on play trays into interesting arrangements, bags, purses and containers.</li> <li>* Measure for a purpose e.g. Find out if a teddy will fit into a bed.</li> <li>* Demonstrate the language for shape, position and measures.</li> <li>*Use Education City and Espresso songs and activities for learning the months of the year and days of the week.</li> <li>*Encourage pupils to know their own daily routine- use symbols and I.C.T resources to support them in sequencing their daily routine.</li> <li>*Use Ninja Time on the I-pad to encourage pupils to begin learning o'clock times. (P8)</li> </ul>
<p><u>Y1 Expectations</u></p> <ul style="list-style-type: none"> <li>• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels</li> <li>• compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =</li> <li>• recognise and use symbols for pounds (£) and pence (p); combine</li> </ul>	<ul style="list-style-type: none"> <li>*Use plastic 2d and 3d shapes to identify the names of shapes and their properties. Identify shapes in objects in the classroom, home etc.</li> <li>* Youtube videos on 2d/3d shape – nice way for pupils to sing along and begin to understand properties * BBC Bitesize –videos on shape – their properties, where we might find them etc.</li> <li>*Use I.C.T games on shape- Education City and Espresso- videos of shape on Espresso. Use the shape activities on Dynamo Maths which will also track pupil's progression.</li> <li>*Encourage pupils to collect their own information, favourite food, T.V show etc.</li> </ul>

amounts to make a particular value

- find different combinations of coins that equal the same amounts of money
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day.
- identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line
- 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, [for example, a circle on a cylinder and a triangle on a pyramid]
- compare and sort common 2-D and 3-D shapes and everyday objects
- order and arrange combinations of mathematical objects in patterns and sequences
- 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 anti-clockwise)
- interpret and construct simple pictograms, tally charts, block diagrams and tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask-and-answer questions about totalling and comparing categorical data

Allow them to make their own pictograms, block graphs and bar charts. Use I.C.T software- Espresso, Numeracy Activity Builder, and Numicon Software to show pictograms and bar charts.

\*Use rulers, metre sticks, tape measures, scales, measuring jugs to allow students to work on standard measures in practical activities.

\* Linking measurement to stories – e.g. making new drink for Willy Wonka, giving pupils the hand of the 'BFG' have to work out the rest of his body based on this etc. \* Encourage children to explore with measuring equipment to allow them to select appropriate equipment.

\*Use big class teaching clocks and interactive whiteboard teaching clocks.

\*Allow pupils to work on time games on Espresso and Education City. Use Ninja Time game on the I-pad.

\*Use calendars and songs on Education city and Espresso to teach pupils the days of the week and months of the year. Encourage pupils to learn their own birthday and other significant dates in the year.

### Y2 Expectations

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using >, < and =
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins that equal the same amounts of money
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day.

See Maths coordinator if we have any pupils working at this level.

## Mathematics APPENDIX

The Mathematics curriculum has been written with reference to the following documents and websites:

- ✚ Performance Indicators for Value Added Target Setting 4<sup>th</sup> Edition (PIVATS).
- ✚ P Scales 2014 <https://www.gov.uk/government/publications/p-scales-attainment-targets-for-pupils-with-sen>
- ✚ Development Matters. 2012.  
[http://www.lancsngfl.ac.uk/curriculum/early\\_years/download/file/Development%20Matters%20in%20the%20Early%20Years%20Foundation%2](http://www.lancsngfl.ac.uk/curriculum/early_years/download/file/Development%20Matters%20in%20the%20Early%20Years%20Foundation%2)

[OStage1.pdf](#)

- ✚ Cornerstones Curriculum
- ✚ Priory Woods PMLD Curriculum map (School shared resources)
- ✚ Routes For Learning (RFL) map
- ✚ Numicon resources (books are kept with Maths resources)
- ✚ Entry Level documents (Maths classroom) and online <http://www.aqa.org.uk/subjects/mathematics/elc/entry-level-certificate-in-mathematics-4930>
- ✚ AQA Unit Awards.