



# ***Data and Measure Progress Ladder***

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OXFORD

## Maths Makes Sense Foundation End-of-year objectives

Counting	Number	Writing
<ul style="list-style-type: none"> <li>Participate in stories, songs and rhymes involving number, repetition and actions</li> <li>Count forwards starting at any number (0–1000)</li> <li>Count backwards starting at any number (0–1000)</li> <li>Count up to 10 objects when asked How many...?, and reply with the correct number</li> <li>Count objects when asked ‘How much is there here?’ and reply with, for example, [number] cups</li> </ul>	<ul style="list-style-type: none"> <li>Read, say and match numbers 0–9</li> <li>Read, say and match numbers 10–20</li> <li>Sequence numbers in order</li> <li>Match the number of objects to the numeral</li> <li>Recognise and say numbers greater than 20 in an everyday context</li> <li>Play simple games that involve use of number</li> </ul>	<ul style="list-style-type: none"> <li>Recognise and write numbers from 0–9</li> <li>Recognise and write numbers from 10–20</li> <li>Recognise and write fractions: <math>\frac{1}{2}</math> <math>\frac{1}{4}</math></li> <li>Copy and write Maths Stories, e.g. <math>2 + 3 - 4 = 1</math></li> </ul>
Calculating	Shape	Position
<ul style="list-style-type: none"> <li>Read what an addition or subtraction Maths Story with 1-digit whole numbers including <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math> (with a whole-number answer) says</li> <li>Read what an addition or subtraction Maths Story with 1-digit whole numbers including <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math> (with a whole-number answer) means</li> <li>Act the Real Story for an addition or subtraction Maths Story with 1-digit whole numbers including <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math> with cups</li> <li>Act out a Real-Life Story an addition or subtraction Maths Story with 1-digit whole numbers including <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math> using, e.g. pennies</li> <li>Share objects into equal groups and count how many in each group</li> <li>Participate in role play prompted by a Maths Story</li> </ul>	<ul style="list-style-type: none"> <li>Recognise, name and describe 2D shapes</li> <li>Play simple games that involve use of number, pattern, shape and language</li> </ul>	<ul style="list-style-type: none"> <li>Follow instructions that involve positional language</li> <li>Give directions that include positional language</li> </ul>
Sorting and data	Measure	Problem-solving
<ul style="list-style-type: none"> <li>Sort objects such as playing cards, number cards, coloured objects, 2D and 3D shapes according to criteria</li> <li>Read information from a simple block graph</li> <li>Make a simple block graph using blocks or bricks</li> </ul>	<ul style="list-style-type: none"> <li>Use comparative language, such as bigger/smaller, shorter/ longer, heavier/lighter to compare quantities.</li> <li>Tell the time using o'clock</li> <li>Use sand timers to measure minutes</li> </ul>	<ul style="list-style-type: none"> <li>Use knowledge and skills of counting to solve simple problems, e.g. counting pairs of socks</li> <li>Use knowledge and skills of songs and rhymes to join in with a modified song or rhyme, e.g. Three Little Dickie Birds</li> <li>Use knowledge and skills of number and calculating to solve simple problems, e.g. sharing nine cakes between three friends</li> <li>Use knowledge and skills of shape, position, sorting and measure to solve simple problems, e.g. building a room with construction bricks</li> </ul>

## Maths Makes Sense 1 – 2 End-of-block objectives

	<b>Maths Makes Sense 1</b>	<b>Maths Makes Sense 2</b>
<b>BLOCK 1</b>	<ul style="list-style-type: none"> <li>• Make shapes with dm sticks from written instructions specifying the number of sides, numbers of sticks and whether the shape should be open or closed</li> <li>• Find the length of a shape by counting dm and respond accurately to the questions: <i>What is the length? How long is this shape? How far is it from one end to the other? What is the distance from one end to the other? What is the total length of the sticks? What is the total length of the sides?</i></li> <li>• Find the perimeter of a closed shape made with dm sticks. Recognise that open shapes do not have a perimeter</li> </ul>	<ul style="list-style-type: none"> <li>• Draw hands on a clock face to show the time to the quarter hour, e.g. quarter to six, five forty-five</li> <li>• Read the time from an analogue clock to the quarter hour, saying it as o'clock or past/to the hour, e.g. <i>quarter to six</i>, and in hours and minutes, e.g. <i>five forty-five</i></li> <li>• Write the 12-hour time in figures, to the quarter hour, e.g. 5:45.</li> </ul>
<b>BLOCK 2</b>	<ul style="list-style-type: none"> <li>• Use the appropriate action for length to show 1 cm, 1 dm and 1 m</li> <li>• Use the appropriate action for mass to show 1 g and 1 kg.</li> </ul>	<ul style="list-style-type: none"> <li>• Select and use measuring tools for length to measure accurately in cm and in m</li> <li>• Select and use measuring tools for mass to measure accurately in g and in kg</li> <li>• Select and use measuring tools for volume to measure accurately in ml.</li> </ul>
<b>BLOCK 3</b>	<ul style="list-style-type: none"> <li>• Measure and record the length of a line in whole centimetres using a ruler</li> <li>• Say and write the mass, indicated by pictures of bags of sugar and baked beans, in kilograms and grams, e.g. write 2 kg 3 g and say: <i>Two kilograms and three grams</i></li> <li>• Draw pictures of bags of sugar and baked beans to represent the mass of items, in kilograms and grams, e.g. draw two kg bags of sugar and three baked beans to show 2 kg 3 g.</li> </ul>	<ul style="list-style-type: none"> <li>• Answer 'How many?' and 'Difference between' questions about information presented in a grid or bar chart by recognising related addition and subtraction Maths Stories.</li> </ul>
<b>BLOCK 4</b>	<ul style="list-style-type: none"> <li>• Associate particular volumes with different objects, e.g. 1 ml with a small box, 5 ml with a teaspoon, 10 ml with a dessert spoon, 50 ml with a pupil cup and 250 ml with a beaker</li> <li>• Select correct combinations of 1p, 2p and 5p coins to buy and sell objects and show <i>Same Value: Different Appearance</i> for coins and objects.</li> </ul>	<ul style="list-style-type: none"> <li>• Write a cm length in dm and cm, e.g. 17 cm = 1 dm 7 cm, and a mm length in cm and mm, e.g. 28 mm = 2 cm 8 mm</li> <li>• Answer word problems by writing the change from £1.</li> </ul>
<b>BLOCK 5</b>	<ul style="list-style-type: none"> <li>• Give change from ten pence in a shopping context.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand information presented in a simple bar chart or pictogram, and use related language, e.g. <i>title, label, bar, symbol</i></li> <li>• Answer simple questions and word problems relating to bar charts and pictograms, e.g. <i>Which fruit was the most popular?</i></li> </ul>
<b>BLOCK 6</b>	<ul style="list-style-type: none"> <li>• Draw the short hand and long hand on a clock face to show duration, e.g. 1 hour 20 minutes, in preparation for telling the time.</li> </ul>	<ul style="list-style-type: none"> <li>• Measure length in millimetres</li> <li>• Record a measurement in mm, in cm and mm, in cm using a decimal point, and to the nearest cm, e.g. 24 mm, 2 cm 4 mm, 2.4 cm and 2 cm</li> <li>• Read the time from an analogue clock for any five-minute interval, in hours and minutes, e.g. <i>five forty, eleven thirty-five</i></li> <li>• Write the 12-hour time for any five-minute interval in figures, e.g. '5:40', '11:35'</li> <li>• Work out the time one hour after a 12-hour time, and record the new time in figures.</li> </ul>

## Maths Makes Sense 3 – 4 End-of-block objectives

	<b>Maths Makes Sense 3</b>	<b>Maths Makes Sense 4</b>
<b>BLOCK 1</b>	<ul style="list-style-type: none"> <li>• Copy grids and bar charts accurately on squared paper</li> <li>• Draw hands on a clock face to show times expressed in analogue form</li> <li>• Write and say times in digital form</li> <li>• Draw hands on a clock face to show times later/earlier than the time shown on a separate clock face (all times in multiples of five minutes)</li> <li>• Calculate time differences shown on a pair of clocks.</li> </ul>	<ul style="list-style-type: none"> <li>• Read metric prefixes, from milli- to kilo-, with any of the basic units of length, mass and volume, and convert between units of measure, e.g. 100 cg = 1 g</li> <li>• Use ratio, vulgar fractions and decimal fractions to compare metric units for length, mass and volume, e.g. compare 1 mg : 1 g : smaller, one to one thousand, 1 : 1000, <math>\frac{1}{1000}</math>, .001</li> <li>• Read metric equivalences using the decimal point for centi- and milli- and the basic unit for length, e.g. 1 mm = .1 cm.</li> </ul>
<b>BLOCK 2</b>	<ul style="list-style-type: none"> <li>• Draw and label points and measure accurately to draw line segments from written instructions, e.g. Draw line segment AB = 3 cm; Draw point C</li> <li>• Use compasses and a pencil to measure accurately and draw a circle following instructions, e.g. draw a circle with centre C and a radius of 3 cm</li> <li>• Accurately measure and draw a regular hexagon using compasses and a ruler.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate the area of a rectangle by writing a multiplication basic Real-Life Story, e.g. <math>3 \text{ m}^2 \times 4 = 12 \text{ m}^2</math></li> <li>• Calculate the volume of a picture combining cuboids by writing a multiplication basic Real-Life Story, e.g. <math>3 \text{ cm}^3 \times 2 \times 5 = 30 \text{ cm}^3</math>.</li> </ul>
<b>BLOCK 3</b>	<ul style="list-style-type: none"> <li>• Look at a grid, bar chart or pie chart and determine the explicit information</li> <li>• Interpret data in a grid, bar chart or pie chart and use implicit information to answer questions that use the vocabulary <i>How many more/fewer ...?; What is the difference between the number of ...?; What is the total ...?</i></li> <li>• Interpret data in a grid, bar chart or pie chart and write a Maths Story to calculate answers to questions about the data</li> <li>• Begin to use ratio when interpreting implicit information in a grid, bar chart or pie chart to answer questions that use the vocabulary <i>What is the ratio of the number of ...?; What fraction of all the ...?</i></li> <li>• Apply the language and notation of comparison to find implicit information in a grid, bar chart, or pie chart, e.g. <i>Two to three; 2 : 3; <math>\frac{2}{3}</math>.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Use the formula <math>C = \pi \times d</math> to calculate the circumference of a circle.</li> </ul>
<b>BLOCK 4</b>	<ul style="list-style-type: none"> <li>• Decide which units to use when measuring length (mm/cm/dm/m) and mass (g/kg)</li> <li>• Calculate areas of drawn rectangles by counting squares and write the answer using square units, e.g. 12 cm<sup>2</sup>, 12 dm<sup>2</sup>, 12 m<sup>2</sup></li> <li>• Calculate volumes of drawn cuboids by counting cubes and write the answer using cubic units, e.g. 12 cm<sup>3</sup></li> <li>• For a labelled picture of a cuboid, write the lengths of edges and the perimeters and areas of named faces.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate the mean of a sample of piles of cups by dividing the total number of cups by the number of piles.</li> </ul>
<b>BLOCK 5</b>	<ul style="list-style-type: none"> <li>• Draw a bar chart for the data that children have collected using a tally chart</li> <li>• Calculate the totals of and differences between two prices, e.g. £3.48 and £1.21.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate equivalent fractions by drawing ratio sticks</li> <li>• Calculate fractions of quantities and recognise that using an equivalent fraction gives the same answer.</li> </ul>
<b>BLOCK 6</b>	<ul style="list-style-type: none"> <li>• Estimate, measure and write mass using kg/g and capacity using l/ml</li> <li>• Calculate the area of drawn rectangles, by recognising that they are made up of several identical rows of 1-cm<sup>2</sup> squares, e.g. Area = <math>3 \text{ cm}^2 \times 4 = 12 \text{ cm}^2</math></li> <li>• Calculate the volume of drawn cuboids, by recognising that they are made up of several identical rows of 1-cm<sup>3</sup> cubes, e.g. Volume = <math>4 \text{ cm}^3 \times 4 = 16 \text{ cm}^3</math></li> <li>• Calculate answers to word problems that involve the subtraction of two areas, e.g. <math>12 \text{ cm}^2 - 5 \text{ cm}^2 = 7 \text{ cm}^2</math>.</li> </ul>	<ul style="list-style-type: none"> <li>• Use ratio to convert between pounds and euros, miles and km, and vice versa, with quantities to two decimal places</li> <li>• Use ratio to convert between seconds, minutes and hours.</li> </ul>

## Maths Makes Sense 5 – 6 End-of-block objectives

	<b>Maths Makes Sense 5</b>	<b>Maths Makes Sense 6</b>
<b>BLOCK 1</b>	<ul style="list-style-type: none"> <li>Solve word problems (involving capacity, volume or length) by using a division Maths Story, identifying the basic Real-Life Story as a Type 1 or Type 2 division</li> <li>Solve word problems (involving capacity, volume or length) by finding a percentage of a value or the result of a percentage increase or decrease</li> <li>Choose the correct operations to solve one-step and multi-step word problems involving capacity, volume or length</li> <li>Make a simple 3D shape by drawing, cutting out and folding a net</li> <li>Recognise that a cube cut through one diagonal forms two congruent triangular prisms.</li> </ul>	<ul style="list-style-type: none"> <li>Solve distance word problems using kilometres</li> <li>Solve volume word problems using millilitres and litres</li> <li>Solve mass word problems using grams and kilograms.</li> </ul>
<b>BLOCK 2</b>	<ul style="list-style-type: none"> <li>Appreciate the need for standard units</li> <li>Know the metric units of mass: g, kg; length: mm, cm, m, km; and volume/capacity: ml, l, cm<sup>3</sup>, m<sup>3</sup></li> <li>Know imperial units of measure, e.g. pound, ounce, inch, foot, yard, mile, pint, gallon</li> <li>Interpret a reading that lies between two unnumbered divisions on a scale</li> <li>Convert between metric units, e.g. kg and g to kg</li> <li>Convert between imperial units, e.g. lb and oz to oz.</li> </ul>	<ul style="list-style-type: none"> <li>Draw a pie chart from data presented in a frequency table.</li> </ul>
<b>BLOCK 3</b>	<ul style="list-style-type: none"> <li>Interpret a calendar</li> <li>Interpret a timetable</li> <li>Use durations of minutes, hours, days or months in calculations and word problems</li> <li>Construct a bar chart and use it to find the <i>mode</i></li> <li>Understand that the <i>mode</i> is the most common value in a set of data.</li> </ul>	<ul style="list-style-type: none"> <li>Solve problems involving ratio and proportion by scaling up or scaling down</li> <li>Interpret and read a scale to measure mass</li> <li>Compare the usefulness of different weighing scales for measuring mass.</li> </ul>
<b>BLOCK 4</b>	<ul style="list-style-type: none"> <li>Interpret a distance-time graph</li> <li>Draw a distance-time graph from given information</li> <li>Round measures of distance and time.</li> </ul>	<ul style="list-style-type: none"> <li>Collect, select, process and present data, making use of ICT</li> <li>Interpret data to answer questions and solve problems</li> <li>Construct and interpret frequency tables, bar charts and pie charts, making use of ICT</li> <li>Plan and carry out a survey, suggesting and developing lines of enquiry, to collect discrete or discrete grouped data.</li> </ul>
<b>BLOCK 5</b>	<ul style="list-style-type: none"> <li>Use ratio to convert between metric units of measure</li> <li>Use ratio to convert between metric and imperial units of measure</li> <li>Estimate the area of a shape in cm<sup>2</sup>.</li> </ul>	<ul style="list-style-type: none"> <li>Convert between yards and metres</li> <li>Calculate the perimeter and the area of compound shapes</li> <li>Calculate surface area and volume of cuboids</li> <li>Solve problems involving dimensions and volume of cuboids.</li> </ul>
<b>BLOCK 6</b>	<ul style="list-style-type: none"> <li>Calculate durations for times specified as a.m./p.m. times and 24-hour clock times</li> <li>Draw and use a double number line showing distance and time to solve word problems involving speed, distance and time</li> <li>Use calculations to solve word problems involving speed, distance and time.</li> </ul>	<ul style="list-style-type: none"> <li>Understand 'the golden ratio', <math>\phi</math> (phi), is a constant with an approximate value of 1.618</li> <li>Calculate ratios, and use ratios to calculate lengths and construct shapes</li> <li>Plan and develop lines of enquiry to research a topic, interpret and evaluate findings</li> <li>Collect, organise, select and present information using appropriate methods, including the use of ICT</li> <li>Work effectively in a group.</li> </ul>