



# Maths

## Assessment – Using and Applying



## Two Rivers Maths Assessment Overview

Level	Sensory Level Descriptors
1(i)	<ul style="list-style-type: none"><li>Pupils encounter activities and experiences. They may be passive or resistant. They may show simple reflex responses, for example, startling at sudden noises or movements. Any participation is fully prompted.</li></ul>
1(ii)	<ul style="list-style-type: none"><li>Pupils show emerging awareness of activities and experiences. They may have periods when they appear alert and ready to focus their attention on certain people, events, objects or parts of objects, for example, attending briefly to interactions with a familiar person. They may give intermittent reactions, for example, sometimes becoming excited in the midst of social activity.</li></ul>
2(i)	<ul style="list-style-type: none"><li>Pupils begin to respond consistently to familiar people, events and objects. They react to new activities and experiences, for example, withholding their attention. They begin to show interest in people, events and objects, for example, smiling at familiar people. They accept and engage in coactive exploration, for example, focusing their attention on sensory aspects of stories or rhymes when prompted.</li></ul>
2(ii)	<ul style="list-style-type: none"><li>Pupils begin to be proactive in their interactions. They communicate consistent preferences and affective responses, for example, reaching out to a favourite person, showing a desire to hold a favourite object. They recognise familiar people, events and objects, for example, vocalising or gesturing in a particular way in response to a favourite visitor. They perform actions, often by trial and improvement, and they remember learned responses over short periods of time, for example, showing pleasure each time a particular puppet character appears in a poem dramatized with sensory cues. Repeating an action with a familiar item of equipment. They cooperate with shared exploration and supported participation, for example, taking turns in interactions with a familiar person, imitating actions and facial expressions.</li></ul>
3(i)	<ul style="list-style-type: none"><li>Pupils begin to communicate intentionally. They seek attention through eye contact, gesture or action. They request events or activities, for example, pointing to key objects or people. They participate in shared activities with less support. They sustain concentration for short periods. They explore materials in increasingly complex ways, for example, reaching out and feeling for objects as tactile cues to events. They observe the results of their own actions with interest, for example, listening to their own vocalisations. They remember learned responses over more extended periods, for example, following the sequence of a familiar daily routine and responding appropriately.</li></ul>



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3(ii)	<ul style="list-style-type: none"><li>Pupils use emerging conventional communication. They greet known people and may initiate interactions and activities, for example, prompting another person to join in with an interactive sequence. They can remember learned responses over increasing periods of time and may anticipate known events, for example, pre-empting sounds or actions in familiar poems. They may respond to options and choices with actions or gestures, for example, by nodding or shaking their heads. They actively explore objects and events for more extended periods, for example, turning the pages in a book shared with another person. They apply potential solutions systematically to problems, for example, bringing an object to an adult in order to request a new activity.</li></ul>
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Level	Curriculum Assessment Statements
4	<ul style="list-style-type: none"><li>Aware if container is empty KPI</li><li>Group similar objects together e.g. put all cars in the garage and all animals on the farm KPI</li><li>Choose between 2 songs given object of references e.g. duck or frog</li><li>Join in with songs when given a contextual clue/object of reference</li><li>Looks for an object they have witnessed been hidden</li><li>Knocks down bricks</li><li>Presses switch to activate an object</li><li>Repeats an action for effect</li><li>Bangs two objects together</li><li>Rolls a ball</li></ul>
5	<ul style="list-style-type: none"><li>Demonstrate an understanding of the concept of transaction (e.g. by exchanging a coin for an item) KPI</li><li>Separates objects where difference is great i.e. Cars and food KPI</li><li>Matches similar pictures</li><li>Helps with 1:1 matching e.g. give each bear a hat</li><li>Responds to find the same</li><li>Recognise big containers can fit in lots or big items</li><li>Recognise small containers fit small items but not big items</li><li>Makes sets with the same amount in each container – to the value of 2.</li><li>Solve simple problems e.g. make sure the box is big enough to fit the item</li></ul>



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	<ul style="list-style-type: none"><li>• Matches colour from 2.</li></ul>
6	<ul style="list-style-type: none"><li>• Copy a simple pattern KPI</li><li>• Copy a simple colour pattern KPI</li><li>• Copy a simple size pattern</li><li>• Copy a simple object pattern</li><li>• Recognises a shape from a choice of up to 4</li><li>• Sort by given criteria - type of objects</li><li>• Sort by given criteria - colour (2)</li><li>• Sorts by size</li><li>• Match pairs of objects – practical or picture.</li><li>• Copy a simple movement pattern</li></ul>
7	<ul style="list-style-type: none"><li>• Copy and continue simple patterns using real-life materials (e.g. apple, orange, apple, orange, etc KPI</li><li>• Recognises obvious error in a group KPI</li><li>• Begin to count when asked how many</li><li>• Responds to key vocabulary</li><li>• To identify the odd one out up to a choice of 4</li><li>• Sorts by colour in a range of environment</li><li>• Give shape name when asked what shape</li><li>• Sort by given criteria across the curriculum</li><li>• Sorts by size / type e.g. shoes and socks / shape</li><li>• Give colour name when asked what colour</li></ul>
8	<ul style="list-style-type: none"><li>• Use real-life materials (e.g. apples or crayons) to add and subtract 1 from a group of objects and indicate how many are now present KPI</li><li>• Copy and continue more advanced patterns using real-life materials (e.g. apple, apple, orange, apple, apple, orange, etc.). KPI</li><li>• Pupils copy a 3 stage repeated pattern</li><li>• Take turns in an adult led game with 3 other peers</li><li>• Plays with picture / dot dominoes</li><li>• Play dice game with adult support</li></ul>



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	<ul style="list-style-type: none"><li>• Pupils can identify what pattern is in repeated pattern sequence</li><li>• Use mathematical language in problem solving situation - score in games, set tables for a picnic</li><li>• Use ordinal language to describe position</li><li>• Make estimates in length i.e. how many hand spans across the table</li></ul>
9	<ul style="list-style-type: none"><li>• Demonstrate an understanding that the total number of objects changes when objects are added or taken away KPI</li><li>• Demonstrate an understanding that the number of objects remains the same when they are rearranged, providing nothing has been added or taken away KPI</li><li>• To continue a 4 stage repeated pattern</li><li>• To create own patterns with three colours</li><li>• To solve simple practical problems involving counting to 20</li><li>• To solve simple practical problems involving ordinal numbers</li><li>• To use mathematical language for addition and subtraction</li><li>• To make estimates of objects to 15</li><li>• To create a simple pattern using numbers eg: 1, 3, 1, 3, 1, 3</li><li>• To be introduced to problem solving language</li></ul>
10	<ul style="list-style-type: none"><li>• Know the value of different coins KPI</li><li>• Identify and name 2D and 3D shapes within the school environment.</li><li>• To recognise patterns in the external environment</li><li>• Begin to enquire and ask questions relating to numbers, shapes and patterns.</li><li>• Identify a Pictogram from a choice of 4 or more</li><li>• Identify a Tally chart from a choice of 4 or more</li><li>• Identify a Block Graph from a choice of 4 or more</li><li>• Identify a Venn Diagram from a choice of 4 or more</li><li>• To use comparative language to compare size of bars in a tally chart</li><li>• To use comparative language to compare size of bars in a block graph</li></ul>
11	<ul style="list-style-type: none"><li>• Use different coins to make the same amount KPI</li><li>• To create, interpret, label and answer questions about a pictogram KPI</li><li>• To create, read and answer questions about a tally chart</li><li>• To collect data using a tally chart</li></ul>



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	<ul style="list-style-type: none"><li>• To know the 5th line on a tally chart is horizontal</li><li>• To add tallies to find the frequency total</li><li>• To create and answer questions about block graphs.</li><li>• To sort using a venn diagram KPI</li><li>• To sort objects into two given categories</li><li>• To sort objects by own criteria KPI</li></ul>
<b>12</b>	<ul style="list-style-type: none"><li>• Use reasoning about numbers and relationships to solve more complex problems and explain their thinking (e.g. <math>29 + 17 = 15 + 4 + \blacklozenge</math>; 'together Jack and Sam have £14. Jack has £2 more than Sam. How much money does Sam have?' etc.) KPI</li><li>• Solve unfamiliar word problems that involve more than one step (e.g. 'which has the most biscuits, 4 packets of biscuits with 5 in each packet or 3 packets of biscuits with 10 in each packet?') KPI</li><li>• To identify which is the x and y axis</li><li>• To label the X and Y axis</li><li>• To create, label and interpret a bar chart</li><li>• To create and interpret a table</li><li>• To use simple scales in pictograms where 1 picture represents more than 1 object</li><li>• To use simple scales in bar charts where each line represents more than 1 KPI</li><li>• To solve one step questions about data</li><li>• To solve two step questions about data</li></ul>
<b>13</b>	<ul style="list-style-type: none"><li>• Construct and interpret simple line graphs KPI</li><li>• Solve problems using information presented in bar charts, pictograms, tables and other graphs. KPI</li><li>• Understand and use a greater range of scales in their representations</li><li>• Use a wide range of resources to collect relevant data</li><li>• From a statement decide what information is required</li><li>• Identify statements which require the collection of data</li><li>• Write a hypothesis to be confirmed by data collection</li><li>• Interpret and present discrete and continuous data using appropriate graphical methods graphical methods</li><li>• Understand and use the mean, mode, range and range to describe sets of data</li><li>• Solve comparison, sum and difference problems</li></ul>



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14	<ul style="list-style-type: none"><li>• Find the mean of a set of quantities. KPI</li><li>• Find the range of a set of quantities. KPI</li><li>• Understand probability on a scale from 0 (impossible) to 1 (certain)</li><li>• Use equally likely outcomes to find the probabilities of simple events</li><li>• Complete, read and interpret information in tables, including timetables</li><li>• Begin to decide which representations of data are most appropriate and why</li><li>• Solve questions about line graphs</li><li>• Construct and interpret a bar chart</li><li>• Construct and interpret a pie chart</li><li>• Construct and interpret a line graph</li><li>• Find the mode, mean, median and range</li></ul>
15	<ul style="list-style-type: none"><li>• Use formal methods to solve multi-step problems (e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?) KPI</li><li>• Calculate with measures (e.g. calculate length of a bus journey given start and end times; convert 0.05km into m and then into cm) KPI</li><li>• Use mathematical reasoning to find missing angles (e.g. the missing angle in an isosceles triangle when one of the angles is given; the missing angle in a more complex diagram using knowledge about angles at a point and vertically opposite angles).</li><li>• Represent discrete data in tables, diagrams and charts, including pie charts, bar charts and line graphs.</li><li>• Group discrete data and represent grouped data graphically.</li><li>• Use probabilities to compare the likelihood of events.</li><li>• Express the probabilities of simple events as fractions.</li><li>• Calculate the mean, median and mode of a set of quantities.</li></ul>
16	<ul style="list-style-type: none"><li>• Estimate the mean of a grouped frequency distribution from discrete data. KPI</li><li>• Use the mean, median, mode and range to compare two sets of data. KPI</li><li>• Understand and write a probability as a fraction, decimal or percentage</li><li>• Construct tables for time series data</li><li>• Know and understand that two events are mutually exclusive when they cannot occur at the same time</li></ul>



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	<ul style="list-style-type: none"><li>• Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables</li><li>• Construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal class intervals</li><li>• Use and interpret scatter graphs of bivariate data</li><li>• Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete data</li><li>• Understand measures of central tendency, including modal class and spread, quartiles and inter-quartile range</li><li>• Recognise on a graph of linear functions, quadratic functions, simple cubic functions and the reciprocal function</li><li>• Solve linear inequalities in one or two variable(s)</li><li>• Use the form <math>y = mx + c</math> to identify parallel and perpendicular lines</li><li>• Identify and interpret roots, intercepts and turning points of quadratic functions graphically</li><li>• Recognise, sketch and interpret graphs of linear functions <math>y = 1/x</math> with <math>x \neq 0</math>, for the exponential function <math>y = kx</math> for positive integer values of <math>k</math>, and the trigonometric function <math>y = \sin x</math> for the angles 0, 30, 45, 60 and 90</li><li>• Understand translations and reflections of a given function</li><li>• Understand reciprocal and exponential graphs</li><li>• Recognise the equation of a circle with centre at the origin</li></ul>
17	<ul style="list-style-type: none"><li>• Draw and interpret scatter diagrams and recognize positive and negative correlation</li><li>• Work out the probability of combined events, including the use of diagrams and tables (including two-way tables).</li><li>• Express probabilities as fractions, decimals and percentages.</li><li>• Apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one</li><li>• Calculate and interpret conditional probabilities through representation using tree diagrams and other representations</li><li>• Apply statistics to describe a population and infer properties of populations or distributions</li><li>• Construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with unequal class intervals</li></ul>





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	<ul style="list-style-type: none"><li>• Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving continuous data</li><li>• Interpret measures of central tendency, including modal class and spread</li><li>• Use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw lines of best fit; make predictions</li><li>• Solve quadratic inequalities in one variable; represent the solution set on a number line</li><li>• Use the form <math>y = mx + c</math> find the equation of the line through two given points</li><li>• Identify and deduce roots algebraically</li><li>• Sketch graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function</li><li>• Check Formula Recognise, sketch and interpret graphs of linear functions <math>y = 1/x</math> with <math>x \neq 0</math>, for the exponential function <math>y = kx</math> for positive integer values of <math>k</math>, and the trigonometric function <math>y = \sin x</math>, <math>y = \cos x</math> and <math>y = \tan x</math> for the angles <math>0^\circ, 30^\circ, 45^\circ</math></li><li>• Sketch translations of a given function</li><li>• Plot (including reciprocal graphs and exponential graphs) graphs of non-standard functions in real contexts</li><li>• Calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs)</li><li>• Recognise and use the equation of a circle with centre at the origin</li><li>• Interpret the gradient of a straight line graph</li><li>• Solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically</li><li>• Solve quadratic equations (including those that require rearrangement) algebraically by factorising</li><li>• Interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of instantaneous and average rate of change (gradients of tangents and chords) in algebraic context</li></ul>
18	<ul style="list-style-type: none"><li>• Calculate the probability of independent and dependent combined events and know the underlying assumptions</li><li>• Calculate and interpret conditional probabilities through representation using Venn diagrams</li><li>• Apply statistics to describe a population and infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling</li><li>• Interpret and construct tables and line graphs for time series data</li></ul>



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- Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving grouped data, including box plots
- Interpret and use measures of central tendency, including modal class and spread, quartiles and inter-quartile range
- Use and interpret scatter graphs of bivariate data; interpolate and extrapolate apparent trends
- Solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph
- Use the form  $y = mx + c$  to find the equation of the line through one point with a given gradient
- Identify and deduce turning points by completing the square
- Interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function
- Check Formula Recognise, sketch and interpret graphs of linear functions  $y = 1/x$  with  $x \neq 0$ , for the exponential function  $y = kx$  for positive integer values of  $k$ , and the trigonometric function  $y = \sin x$ ,  $y = \cos x$  and  $y = \tan x$  for angles of any size
- Sketch translations and reflections of a given function
- Plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems
- Calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts
- Recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given point
- Interpret the gradient of a straight line graph as a rate of change that illustrates direct and inverse proportion
- Solve two simultaneous equations in two variables (linear/linear or linear/quadratic) finding approximate solutions using a graph
- Solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph
- Interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of instantaneous and average rate of change (gradients of tangents and chords) in graphical context