Maths key assessment criteria

Key Assessment Criteria: *Being a mathematician (full version)*

A year 1 mathematician

Number and place value
- I can count to and across 100, forward and backwards ,beginning with 0 or 1 from any number.
- I can count in multiples of 2, 5 and 10.
- I can count, read and write numbers to 100 in numerals.
- I can say what is one more or one less than any number.
- I can read and write numbers from 1 to 20 in numerals and words.
- I can 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

Calculations
- I can represent and use number bonds and related subtraction facts to 20.
- I can add and subtract 1-digit and 2-digit numbers to 20, including zero.
- I can read, write and interpret mathematical statements involving addition, subtraction and equals signs.
- I can solve one-step problems that involve addition and subtraction, using objects and pictorial representations.
- I can solve missing number problems.
- I can solve one-step problems involving multiplication and division, by using concrete objects, pictorial representations and arrays.

Fractions
- I can recognise, find and name a half of an object, shape or quantity.
- I can recognise, find and name a quarter of an object, shape or quantity.

Measurement
- I can compare, describe and solve practical problems for lengths and heights; mass/weight; capacity and volume; and time.
- I can measure and begin to record lengths and heights; mass/weight; capacity and volume; and time.
- I recognise and know the value of different denominations of coins and notes.
- I can tell the time to the hour.
- I can tell the time to half past the hour.
- I can draw hands on a clock face to show these times.
- I can sequence events in chronological order using language.
- I recognise and use language relating to dates, including days, weeks, months and years

Geometry – properties of shapes
- I recognise and can name common 2D shapes (rectangles, including squares, circles and triangles.
- I recognise and can name common 3D shapes (cuboids, including cubes, pyramids and spheres.

Geometry – position and direction
- I can describe position, directions and movement, including half, quarter and three-quarter turns.

Key Assessment Criteria: *Being a mathematician (full version)*

A year 2 mathematician

Number and place value
- I can count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward.
- I can read and write numbers to at least 100 in numerals and in words.
- I can compare and order numbers from 0 up to 100; using < > = signs.
- I recognise the place value of each digit in a 2-digit number.
- I can identify, represent and estimate numbers using different representations, including the number line.
- I can use place value and number facts to solve problems.

Calculations
- I can recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
- I can add and subtract mentally, including:
    - A 2-digit number and ones
    - A 2-digit number and tens
    - Two 2-digit numbers
    - Adding three 1-digit numbers
- I can add and subtract numbers using concrete objects and pictorial representations, including:
    - A 2-digit number and ones
    - A 2-digit number and tens
    - Two 2-digit numbers
    - Adding three 1-digit numbers
- I recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.
- I can solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.
- I can solve problems with addition and subtraction applying my increasing knowledge of mental and written methods.
- I can recall and use multiplication and division facts for the 2, 5 and 10x tables, including recognising odd and even numbers.
- I can calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals signs.
- I can solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context.
- I can show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
- I can show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

Fractions
- I recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity.
- I can write simple fractions.
- I recognise the equivalence of 2/4 and 1/2.

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

Geometry – properties of shapes
- I can compare and sort common 2D shapes and everyday objects.
- I can compare and sort common 3D shapes and everyday objects.
- I can identify and describe the properties of 2D shapes, including the number of sides and line of symmetry in a vertical line.
- I can identify and describe the properties of 3D shapes including the number of edges, vertices and faces.
- I can identify 2D shapes on the surface of 3D shapes.

Geometry – position and direction
- I can order and arrange combinations of mathematical objects in patterns and sequences.
- I can 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).

Statistics
- I can interpret and construct simple pictograms.
- I can interpret and construct tally charts.
- I can interpret and construct block diagrams.
- I can interpret and construct simple tables.
- I can ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.
- I can ask and answer questions about totalling and comparing categorical data.

Key Assessment Criteria: *Being a mathematician (full version)*

A year 3 mathematician

Number, place value, approximation and estimation/rounding

- I can count from 0 in multiples of 4, 8, 50 and 100.
- I can compare and order numbers up to 1,000.
- I can read and write numbers to 1,000 in numerals and words.
- I can find 10 or 100 more or less than a given number.
- I can recognise the place value of each digit in a 3-digit number.
- I can identify, represent and estimate numbers using different representations.
- I can solve number problems and practical problems using above.

Calculations

- I can add and subtract mentally, including:
  - A 3-digit number and ones
  - A 3-digit number and tens
  - A 3-digit number and hundreds
- I can add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.
- I can estimate the answer to a calculation and use inverse operation to check answers.
- I can solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
- I can recall and use multiplication and division facts for the 3, 4 and 8x tables.
- I can write and calculate mathematical statements for multiplication and division using the multiplication tables, including for 2-digit numbers, using mental and progressing to formal written methods.
- I can solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects.

Fractions, decimals and percentages

- I can count up and down in tenths.
- I recognise that tenths arise from dividing an object into 10 equal parts and in dividing 1-digit numbers or quantities by 10.
- I recognise and can find and write factions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
- I can compare and order unit fractions and factions with the same denominators.
- I can add and subtract factions with the same denominator within one whole.
- I can solve problems involving the above.

Measurement

- I can compare lengths using m, cm &mm.
- I can compare mass using kg & g.
- I can compare volume/capacity using l & ml.
- I can measure lengths using m, cm & mm.
- I can measure mass using kg & g.
- I can measure volume/capacity using l & ml.
- I can add and subtract lengths using m, cm & mm.
- I can add and subtract mass using kg & g.
- I can add and subtract volume/capacity using l & ml.

- I can tell and write the time from an analogue clock (12 hour clock).
- I can tell and write the time from an analogue clock (24 hour clock).
- I can tell and write the time from an analogue clock (Roman numerals).
- I can estimate and read time with increasing accuracy to the nearest minute.
- I can record and compare time in terms of seconds, minutes and hours.
- I can use the following vocabulary: o'clock, am, pm, morning, afternoon, noon & midnight.
- I know the number of seconds in a minute.
- I know the number of days in each month, year and leap year.
- I can compare the duration of events.

- I can measure the perimeter of simple 2D shapes.

- I can add and subtract amounts of money to give change, using both £ and p in a practical context.

Geometry – properties of shapes

- I can identify horizontal, vertical lines and pairs of perpendicular and parallel lines.
- I can draw 2D shapes.
- I can make 3D shapes using modelling materials.
- I recognise 3D shapes in different orientations and describe them.
- I recognise that angles are a property of shape or a description of a turn.
- I can identify right angles.
- I recognise that two right angles make a half-turn & three make a three quarter turn.
- I can identify whether angles are greater than or less than a right angle.

Statistics

- I can interpret and present data using bar charts, pictograms and tables.
- I can solve one-step and two-step questions using information presented in scaled bar charts, pictograms and tables.

Key Assessment Criteria: *Being a mathematician (full version)*

A year 4 mathematician

Number, place value, approximation and estimation/rounding
- I can count in multiples of 6, 7, 9, 25 and 1,000.
- I can order and compare numbers beyond 1,000.
- I can find 1,000 more or less than a given number.
- I recognise the place value of each digit in a 4-digit number.
- I can read Roman numerals to 100 and know that over time the numeral system changed to include the concept of zero and place value.
- I can identify, represent and estimate numbers using different representations.
- I can round any number to the nearest 10, 100 or 1,000.
- I can count backwards through zero to include negative numbers.
- I can solve number and practical problems with the above (involving increasingly large numbers).

Calculations
- I can add and subtract numbers with up to 4-digits using the formal written methods of columnar addition and subtraction.
- I can estimate and use inverse operations to check answers in a calculation.
- I can solve addition and subtraction 2-step problems in contexts, deciding which operations and methods to use and why.
- I an recall multiplication and division facts up to 12x12.
- I can use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.
- I recognise and use factor pairs and commutativity in mental calculations.
- I can multiply 2-digit numbers by a 1-digit number using formal written layout.
- I can solve problems involving multiplying and adding, including using the distributive law to multiply 2-digit numbers by 1-digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Fractions, decimals and percentages
- I an count up and down in hundredths.
- I recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten.
- I recognise and show using diagrams, families of common equivalent fractions.
- I can add and subtract factions within the same denominator.
- I recognise and write decimal equivalents to 1/4, 1/2 and ¾.
- I recognise and write decimal equivalents of any number of tenths or hundredths.
- I can round decimals with one decimal place to the nearest whole number.
- I can compare numbers with the same number of decimal places up to 2 decimal places.
- I can find the effect of dividing a 1-digit or 2-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.
- I can solve problems involving increasingly harder factions and fractions to divide quantities, including non-unit fractions where the answer is a whole number.
- I can solve simple measure and money problems involving fractions and decimals to 2 decimal places.

Measurement
- I can compare different measures, including money in £ and p.
- I can estimate different measures, including money in £ and p.
- I can calculate different measures. Including money in £ and p.

- I can read, write and convert time between analogue and digital 12 hour clocks.
- I can read, write and convert time between analogue and digital 24 hour clocks.
- I can solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

- I can convert between different units of measurements
- I can measure and calculate the perimeter of a rectilinear figure in cm and m.
- I can find the area of rectilinear shapes by counting squares.
- I can calculate different measures

Geometry – properties of shapes
- I can compare and classify geometric shapes, including quadrilateral and triangles based on their properties and sizes.
- I can identify lines of symmetry in 2D shapes presented in different orientations.
- I can complete a simple symmetric figure with respect to a specific line of symmetry,
- I can identify acute and obtuse angles and compare and order angles up to two right angles by size.

Geometry – position and direction
- I can describe movements between positions as translations of a given unit to the left/right and up/down.
- I can describe positions on a 2D grid as coordinates in the first quadrant.
- I can plot specified points and draw sides to complete a given polygon.

Statistics
- I can interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
- I can solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Key Assessment Criteria: *Being a mathematician (full version)*

A year 5 mathematician

Number, place value, approximation and estimation/rounding
- I can count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.
- I can read, write, order and compare numbers to at least 1,000,000.
- I can determine the value of each digit in numbers up to 1,000,000.
- I can read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.
- I can round any number up to 1,000,000 to the nearest 10, 100, 1000, 10000 and 100000.
- I can interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.
- I can solve number problems and practical problems with the above.

Calculations
- I can add and subtract numbers mentally with increasingly large numbers.
- I can add and subtract whole numbers with more than 4 digits, including using formal written methods.
- I can use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- I can identify multiples and factors, including finding all factor pairs or a number and common factor pairs of two numbers.
- I use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- I can establish whether a number up to 100 is prime and recall prime numbers up to 19.
- I recognise and use square numbers and cube numbers, and the notation for squared and cubed.
- I can multiply and divide numbers mentally drawing on known facts.
- I can multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- I can multiply numbers up to 4 digits by a 1-digit or 2-digit number using a formal written method, including long multiplication for 2-digit numbers.
- I can divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context.
- I can solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes.
- I can solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
- I can solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates.

Fractions, decimals and percentages
- I can recognise mixed numbers and improper fractions and convert from one form to the other.
- I can write mathematical statements >1 as a mixed number.
- I can identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- I can compare and order fractions whose denominators are multiples of the same number.
- I can add and subtract fractions with the same denominator and denominators that are multiples of the same number.
- I can multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- I can read and write decimal numbers as fractions.
- I recognise and can use thousandths and relate them to tenths, hundredths and decimal equivalents.
- I can round decimals with 2 decimal places to the nearest whole number and 1 decimal place.
- I can read, write, order and compare numbers with up to 3 decimal places.
- I can solve problems involving numbers up to 3 decimal places.
- I recognise the percent symbol and understand that percent relates to 'number parts per hundred'.
- I can write percentages as a fraction with denominator hundred, and as a decimal.
- I can solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator or a multiple of 10 or 25.

Measurement
- I can solve problems involving converting between units of time.
- I can convert between different units of metric measure.
- I understand and use approximate equivalences between metric units and common imperial units, such as inches, pounds and pints.
- I can measure and calculate the perimeter of composite rectilinear shapes in cm and m.
- I can calculate and compare the area of rectangles (incl squares), and including using standard units (cm^2 and cm^3) to estimate the area of irregular shapes.
- I can estimate volume and capacity.
- I can use all four operations to solve problems involving money using decimal notation, including scaling.

Geometry – properties of shapes
- I can use the properties of rectangles to deduce related facts and find missing lengths and angles.
- I can distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- I can identify 3D shapes, including cubes and other cuboids, from 2D representations.
- I know angles are measured in degrees.
- I can estimate and compare acute, obtuse and reflex angles.
- I can identify angles at a point and one whole turn.
- I can identify angles at a point on a straight line and ½ a turn.
- I can identify other multiples of 90°.
- I can draw given angles and measure them in degrees.

Geometry – position and direction
- I can identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

Statistics
- I can complete, read and interpret information in tables, including timetables.
- I can solve comparison, sum and difference problems using information presented in a line graph.

Key Assessment Criteria: *Being a mathematician (full version)*

A year 6 mathematician

Number, place value, approximation and estimation/rounding
- I can read, write, order and compare numbers up to10,000,000.
- I can determine the value of each digit in numbers up to 10,000,000.
- I can round any whole number to a required degree of accuracy.
- I can use negative numbers in context, and calculate intervals across zero.
- I can solve number problems and practical problems with the above.

Calculations
- I can use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
- I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- I can identify common factors, common multiples and prime numbers.
- I can perform mental calculations, including with mixed operations and large numbers.
- I can multiply multi-digit numbers up to 4 digits by a 2 digit whole number using the formal written method of long multiplication.
- I can divide numbers up to 4 digits by a 2 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.
- I can divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate.
- I can solve problems involving addition, subtraction, multiplication and division.
- I can use my knowledge of the order of operations to carry out calculations involving the four operations.

Fractions, decimals and percentages
- I can use common factors to simplify fractions and use common multiples to express fractions in the same denomination.
- I can compare and order fractions, including fractions >1.
- I can add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
- I can multiply simple pairs of proper fractions, writing the answer in the simplest form.
- I can divide proper fractions by whole numbers.
- I can associate a fraction with division to calculate decimal fractions equivalents for a simple fraction.
- I can identify the value of each digit to 3 decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to 3 decimal places.
- I can multiply 1-digit numbers with up to 2 decimal places by whole numbers.
- I can use written division methods in cases where the answer has up to 2 decimal places.
- I can solve problems which require answers to be rounded to specified degrees of accuracy.
- I an recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Ratio and proportion
- I can solve problems involving the relative sizes of two quantities, where missing values can be found using integer multiplication and division facts.
- I can solve problems involving the calculation of percentages and the use of percentage comparisons.
- I can solve problems involving similar shapes where the scale factor is known or can be found.
- I can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Algebra
- I can express missing number problems algebraically.
- I can use a simple formulae.
- I can generate and describe linear number sequences.
- I can find pairs of numbers that satisfy an equation with two unknowns.
- I can enumerate possibilities of combinations of two variables.

Measurement
- I can use, read, write 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 of up to 3 decimal places.
- I can convert between miles and kilometres.
- I recognise that shapes with the same areas can have different perimeters and vice versa.
- I can calculate the area of parallelograms and triangles.
- I recognise when it is possible to use the formulae for the area of shapes.
- I can calculate, estimate and compare volume of cubes and cuboids, using standard units.
- I recognise when it is possible to use the formulae for the volume of shapes.
- I can solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate.

Geometry – properties of shapes
- I can compare and classify geometric shapes based on the properties and sizes.
- I can describe simple 3D shapes.
- I can draw 2D shapes given dimensions and angles.
- I recognise and build simple 3D shapes, including making nets.
- I can find unknown angles in any triangles, quadrilaterals and regular polygons.
- I recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
- I can illustrate and name parts of circles, including radius, diameter and circumference.
- I know the diameter is twice the radius.

Geometry – position and direction
- I can draw and translate simple shapes on the co-ordinate plane, and reflect them in the axes.
- I can describe positions on the full co-ordinate grid (all four quadrants).

Statistics
- I can interpret and construct pie charts and line graphs and use these to solve problems
- I can calculate and interpret the mean as an average.