

Thresholds for Mathematics to be crossed by the end of Year 1 (“Year 2 ready”)

Number (Number and Place Value)

Counts to and across 100, forwards and backwards, beginning with 0 or one, or from any given number

Counts, reads and writes numbers to 100 in numerals; counts in multiples of twos, fives and tens

Given a number, identifies one more and one less

Number (Addition and Subtraction)

Represents and uses (including in written forms) number bonds and related subtraction facts within 20

Number (Multiplication and Division)

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

Number (Fractions - including decimals and percentages)

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 one of four equal parts of an object, shape or quantity

Measurement

Compares, describes and solves practical problems for:
lengths and heights, mass/weight, capacity and volume and time

Tells the time to the hour and half past the hour and draws the hands on a clock face to show these times

Recognise and know the value of different denominations of coins and notes

Geometry (Properties of Shape)

Recognises and names common 2-D and 3-D shapes, including:
i) 2-D shapes eg rectangles (including squares), circles and triangles;
ii) 3-D shapes eg cuboids (including cubes), pyramids and spheres.

Thresholds for Mathematics to be crossed by the end of Year 2 (“Year 3 ready”)

Number (Number and Place Value)

Counts in steps of two, three, and five from 0, and in tens from any number, forward and backward

Compares and orders numbers from 0 up to 100

Uses $<$ $>$ and $=$ signs correctly

Uses place value and number facts to solve problems including partitioning

Number (Addition and Subtraction)

Solves problems with addition and subtraction by i) using concrete objects and pictorial representations, including those involving numbers, quantities and measures; and ii) applying an increasing knowledge of mental and written methods.

Recalls and uses addition and subtraction facts to 20 and 100 (fluently up to 20).

Add two 2 digit numbers within 100

Use estimation to check that their answers to a calculation are reasonable (within 100)

Subtract mentally a 2-digit number from another 2-digit number when there is no re-grouping required

Recognise the inverse relationships between addition and subtraction and work out missing number problems

Number (Multiplication and Division)

Recalls, uses and writes multiplication and division facts for the two, five and 10 multiplication tables, including recognising odd and even numbers

Solves problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number (Fractions - including decimals and percentages)

Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{2}{4}$, and $\frac{3}{4}$ of a length, shape, set of objects or quantity

Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

Measurement

Solves simple problems in a practical context involving addition and subtraction of money of the same unit including giving change

Use different coins to make the same amount

Tells the time to the nearest 15 minutes

Read scales in divisions of 1s, 2s, 5s and 10s in a practical situation where all numbers on a scale are given

Geometry (Properties of Shape)

Compares and sorts common 2-D and 3-D shapes and everyday objects

Identify number of sides, vertices and lines of symmetry in 2D shapes.

Identify and describe edges, vertices and faces in 3D shapes.

Geometry (Position and Direction)

Uses mathematical vocabulary to describe position, direction and movement including movement in a straight line, and distinguishes between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)

Statistics

Asks and answers questions about totalling and comparing categorical data

Thresholds for Mathematics to be crossed by the end of Year 3 (“Year 4 ready”)

Number (Number and Place Value)

Counts from 0 in multiples of four, eight, 50 and 100

Find 10 or 100 more or less than a given number

Recognises the place value of each digit in a three-digit number (hundreds, tens, and ones)

Solves number problems and practical problems involving these ideas

Number (Addition and Subtraction)

Add and subtract number with up to 3 digits using formal written methods

Adds and subtracts numbers mentally including:

- a three-digit number and ones;
- a three-digit number and tens; and
- a three-digit number and hundreds.

Number (Multiplication and Division)

Recalls and uses multiplication and division facts for the multiplication tables: · three; · four; and · eight.

Writes and calculates mathematical statements for multiplication and division using the multiplication tables that are known including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Number (Fractions - including decimals and percentages)

Count up and down in tenths; recognises that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10

Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

Recognises and shows, using diagrams, equivalent fractions with small denominators

Measurement

Measures, compares, adds and subtracts lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)

Tells and writes the time from an analogue clock and 12-hour and 24-hour clocks

Adds and subtracts amounts of money to give change, using both £ and p in practical contexts

Geometry (Properties of Shape)

Draw 2D shapes and make 3D shapes

Identifies right angles, recognises that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identifies whether angles are greater than or less than a right angle

Identify perpendicular and parallel lines

Statistics

Interprets and presents data using bar charts, pictograms and tables

Thresholds for Mathematics to be crossed by the end of Year 4 (“Year 5 ready”)

Number (Number and Place Value)

Counts in multiples of six, seven, nine, 25 and 1,000

Find 1000 more or less than a given number

Counts backwards through zero to include negative numbers

Orders and compares numbers beyond 1,000

Rounds any number to the nearest 10, 100 or 1,000

Number (Addition and Subtraction)

Add and subtract number (including mentally) with up to 4 digits using formal written methods

Solves addition and subtraction two-step problems in context, deciding which operations and methods to use and why

Number (Multiplication and Division)

Recalls multiplication and division facts for multiplication tables up to 12 x 12

Multiply two digit and three digit numbers by a one digit number using formal written layout

Number (Fractions - including decimals and percentages)

Recognise and show, using diagrams, families of common equivalent fractions

Count up and down in hundredths; recognises that hundredths arise when dividing an object by 100 and dividing tenths by 10

Round decimals with one decimal place to the nearest whole number

Solve simple measure and money problems involving fractions and decimals to two decimal places

Measurement

Solves simple problems using 12-hour and 24-hour clocks

Converts between different units of measure eg kilometre to metre; hour to minute

Geometry (Properties of Shape)

Compares and classifies geometric shapes, including quadrilaterals and triangles, based on their properties and sizes

Identifies lines of symmetry in two dimensional shapes presented in different orientations

Geometry (Position and Direction)

Plots specified points and draws sides to complete a given polygon

Statistics

Solves comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

Thresholds for Mathematics to be crossed by the end of Year 5 (“Year 6 ready”)

Number (Number and Place Value)

Reads, writes, orders and compares numbers to at least 1,000,000 and determines the value of each digit

Rounds any number up to 1,000,000

Interprets negative numbers in context, counts forwards and backwards with positive and negative whole numbers including through zero.

Number (Addition and Subtraction)

Adds and subtracts whole numbers (and with decimals to 2dp) with more than four digits, including using formal written methods (columnar addition and subtraction)

Adds and subtracts numbers mentally with increasingly large numbers (eg $12,462 - 2,300 = 10,162$)

Number (Multiplication and Division)

Identifies multiples and factors including finding all factor pairs of a number and common factors of two numbers

Solves problems involving multiplication and division (including 4 digit \times 1 digit and 2 digit, and 4 digit \div 1 digit) including using a knowledge of factors and multiples, squares and cubes

Number (Fractions - including decimals and percentages)

Compare and order fractions whose denominators are all multiples of the same number

Read and write decimal numbers as fractions eg $0.71 = 71/100$

Read, write, order and compare numbers with up to three decimal places

Solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those fractions with a denominator of a multiple of 10 or 25

Ratio and Proportion

Solves problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

Measurement

Converts between different units of metric measure (eg kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)

Measures and calculates the perimeter of composite rectilinear shapes in centimetres and metres

Calculates and compares the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²)

Geometry (Properties of Shape)

Draws given angles and measures them in degrees

Distinguishes between regular and irregular polygons based on reasoning about equal sides and angles

Statistics

Completes, reads and interprets information in tables, including timetables

Thresholds for Mathematics to be crossed by the end of Year 6 (“Year 7 ready”)

Number (Number and Place Value)

Reads, writes, orders and compares numbers to at least 10,000,000 and determines the value of each digit including decimals

Rounds any whole number to a required degree of accuracy

Uses negative numbers in context and calculates intervals across zero

Number (Addition and Subtraction)

Solves addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Use estimation to check answers to calculations and determines, in the context of a problem, an appropriate degree of accuracy

Number (Multiplication and Division)

Multiplies multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication

Use estimation to check answers to calculations and determines, in the context of a problem, an appropriate degree of accuracy

Divides numbers up to four digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

Number (Fractions - including decimals and percentages)

Use written division methods in cases where the answer has up to two decimal places

Solves problems which require answers to be rounded to specified degrees of accuracy

Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Solve problems involving the calculation of percentages e.g. of measures and calculations such as 15 per cent of 360, and the use of percentages for comparison

Solves problems involving unequal sharing and grouping using knowledge of fractions and multiples

Ratio and Proportion

Solves problems involving the calculation of percentages eg. of measures and calculations such as 15 per cent of 360, and the use of percentages for comparison.

Solves problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Algebra

Uses simple formulae to solve problems

Measurement

Uses, reads, writes and converts 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 to up to three decimal places

Geometry (Properties of Shape)

Compares and classifies geometric shapes based on their properties and sizes and finds unknown angles in any triangles, quadrilaterals and regular polygons

Geometry (Position and Direction)

Draws and translates simple shapes on the coordinate plane and reflects them in the axes

Statistics

Interprets pie charts and line graphs and uses these to solve problems

Calculates and interprets the mean as an average

Appendix 1

End of KS1 Interim Assessment Framework 2017 “At the Standard”

Working at the expected standard

The pupil can:

- partition two-digit numbers into different combinations of tens and ones. This may include using apparatus (e.g. 23 is the same as 2 tens and 3 ones, which is the same as 1 ten and 13 ones)
 - add 2 two-digit numbers within 100 (e.g. $48 + 35$) and can demonstrate their method using concrete apparatus or pictorial representations
 - use estimation to check that their answers to a calculation are reasonable (e.g. knowing that $48 + 35$ will be less than 100)
 - subtract mentally a two-digit number from another two-digit number when there is no regrouping required (e.g. $74 - 33$)
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- recognise the inverse relationships between addition and subtraction and use this to check calculations and work out missing number problems (e.g. $\Delta - 14 = 28$)
 - recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables to solve simple problems, demonstrating an understanding of commutativity as necessary (e.g. knowing they can make 7 groups of 5 from 35 blocks and writing $35 \div 5 = 7$; sharing 40 cherries between 10 people and writing $40 \div 10 = 4$; stating the total value of six 5p coins)
 - identify $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{4}$ and knows that all parts must be equal parts of the whole.
 - use different coins to make the same amount (e.g. use coins to make 50p in different ways; work out how many £2 coins are needed to exchange for a £20 note)
 - read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given (e.g. pupil reads the temperature on a thermometer or measures capacities using a measuring jug)
 - read the time on the clock to the nearest 15 minutes
 - describe properties of 2-D and 3-D shapes (e.g. the pupil describes a triangle: it has 3 sides, 3 vertices and 1 line of symmetry; the pupil describes a pyramid: it has 8 edges, 5 faces, 4 of which are triangles and one is a square).

Appendix 2

End of KS2 Interim Assessment Framework 2017 “At the Standard”

Working at the expected standard

The pupil can:

- demonstrate an understanding of place value, including large numbers and decimals (e.g. what is the value of the '7' in 276,541?; find the difference between the largest and smallest whole numbers that can be made from using three digits; $8.09 = 8 + \frac{9}{100}$; $28.13 = 28 + \square + 0.03$)
- calculate mentally, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation (e.g. $53 - 82 + 47 = 53 + 47 - 82 = 100 - 82 = 18$; $20 \times 7 \times 5 = 20 \times 5 \times 7 = 100 \times 7 = 700$; $53 \div 7 + 3 \div 7 = (53 + 3) \div 7 = 56 \div 7 = 8$)
- 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?)
- recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as $\frac{1}{5}$ or 0.2 or 20% of the whole cake)
- calculate using fractions, decimals or percentages (e.g. knowing that 7 divided by 21 is the same as $\frac{7}{21}$, and that this is equal to $\frac{1}{3}$; 15% of 60; $1\frac{1}{2} + \frac{3}{4}$; $\frac{7}{9}$ of 108; 0.8×70)
- substitute values into a simple formula to solve problems (e.g. perimeter of a rectangle or area of a triangle)
- 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)
- 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).