Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4

Number & Place Value

Order and compare numbers beyond 1000.

Order a set of whole numbers in ascending / descending order recognising the most significant digit in this process, e.g., 2500, 900, 750, 5300, 2501.

Compare numbers and quantities by:

using = < and > symbols, e.g., ▢ < 3445 ▢ 5089;

placing numbers accurately on an un-numbered number line where only the start and end numbers are known.

Describe the positional relationship between two numbers, e.g., 6721 is larger than 7000 but smaller than 8000. (This may be in the context of rounding activities.)

Order a selection of numbers / quantities greater than 1,000 in ascending / descending order, e.g., premier division football crowds.

Identify, represent and estimate numbers using different representations.

Using Apparatus and Visuals

Interpret information given in visual format, such as, on a partially marked number line.

Draw diagrams when recording or jotting, e.g., Use a number to work out a calculation.

Organise written responses in a systematic way, such as, in a list or table, or ordered columns.

Estimation

It becomes difficult to provide large numbers to estimate in practical contexts but work using smaller numbers can be continued to consolidate work from Year 3.

Estimate a number of objects or pictures of objects using approximation language, e.g., 'It's between one and two thousand.' or 'It's about 1200.'

Estimate the possible position of numbers on a blank number line / stick with any designated start and end numbers.

Estimate and show quantities on scaled measuring apparatus.

Round any number to the nearest 10, 100 or 1000.

Round numbers to the nearest 10, understanding the rule that if the units are below 5 round down, and if they are above 5 round up.

Round numbers to the nearest 100, understanding the rule that if the tens are below 50 round down, and if they are above 50 round up.

IMPORTANT: check that pupils do not have misconceptions about rounding to the nearest 100 that involves a number ending in 5. They need to understand that 345 rounds to 300 to the nearest 100 and not to 400 because they should be looking at both the tens and the units, not just the units. If they think that 5 rounds up from the previous descriptor they might round 345 up to the next 100 instead of down.

Round numbers to the nearest 1,00, understanding the rule that if the hundreds are below 500 round down, and if they are above 500 round up.

Use rounding in different contexts, such as rounding measurements to the nearest cm, m, km.

Round money to the nearest pound.

Estimate, compare and calculate different measures. (Measurement: Year 4)

Solve number and practical problems that involve all of the above and with increasingly large positive numbers.

Solve counting, sequences and prediction problems, e.g.:

Steps of 50p in a sequence such as £0.50, £1.00, £1.50, £2.00.

Steps of 25 cm in a sequence such as 1.25 m, 1.5 m, 1.75 m.

Do all multiples of 6 end in 6, 2, 8, 4 and 0?

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Use and apply number and place value in word problems and investigation, e.g.:

1275 = 1,000 + ▢ + 70 + 5.

Play calculator zap. (Put a four-digit number into the calculator and remove each digit in turn with one calculation, recording what has been done.)

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. (Number: Addition and Subtraction, Year 4)

Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.

Roman numerals can be viewed as a form of algebra.

Know values of the Roman numerals I = 1, V = 5, X = 10, L = 50, C = 100.

Write numbers in Roman numerals correctly, e.g., by labelling a clock face, using the rules:

When a symbol appears after a larger symbol it is added, e.g., VI = V + I = 5 + 1 = 6.

When a symbol appears before a larger symbol it is subtracted, e.g., IX = X – I = 10 – 1 = 9.

Don't use the same symbol more than three times in a row.

I is only used in front of V and X, e.g., 99 is not IC (100 – 1).

Convert numbers to Roman numerals by recognising the tens and ones components, e.g., In LXXXVIII the L followed by the X is the tens number and anything afterwards is the ones.

Know that the Romans did not have anything to represent zero and this made calculation very difficult, e.g., try calculating LXXXVIII + XLIV in Roman numerals and comparing this with our numbers column addition.

Count in multiples of 6, 7, 9, 25 and 1000.

Count in multiples of 6

Count forwards and backwards in multiples of 6 from any multiple of 6.

Recognise digit patterns.

Count in multiples of 7

Count forwards and backwards in multiples of 7 from any multiple of 7.

Recognise digit patterns.

Count in multiples of 9

Count forwards and backwards in multiples of 9 from any multiple of 9.

Recognise digit patterns.

Count in multiples of 25

Count forwards and backwards in multiples of 25 from any multiple of 25.

Recognise digit patterns.

Count in measures and money contexts.

Count in multiples of 1,000

Count forwards and backwards in multiples of 1,000 from any multiple of 1,000.

Recognise digit patterns.

Count in measures contexts.

Count in steps of hundredths.

Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred; and dividing tenths by ten. (Fractions, Year 4)

Find 1000 more or less than a given number.

Count orally from a given number increasing or decreasing by 1,000 and explain the digit patterns including the impact of crossing boundaries when moving between 1,000s and 10,000s.

Respond correctly to questions, e.g.:

Year 4 Mathematics Curriculum Objectives

What is 1,000 more than 67?
What is 1,000 less than 32,000?
Count backwards through zero to include negative numbers
Count forwards and backwards in ones through the zero boundary and discuss what happens when zero is reached, e.g., Use counting decisticks, counting hoops, etc.
Count forwards and backwards in different step numbers of equal size through the zero boundary, e.g., Starting at 10 count back in twos until -10 is reached.
Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones).
Recognise and write decimal equivalents of any number of tenths or hundredths. (Number: Fractions, Year 4)
Partition numbers into thousands, hundreds, tens and ones.
Understand zero as a place-holder in numbers, such as 2036, 4305, and 6007.
Know the value of a chosen digit in a given number, e.g., in 1275 the 2 has a value of 200.

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4

Addition & Subtraction

Add and subtract numbers with up to 4 digits using the written methods of addition and subtraction where appropriate.

Select an appropriate calculation method, e.g., Respond to the size of numbers / complexity of calculation, such as, if an item costs £1·99 and change is required from £5 this should be done mentally

Building Mental Strategies

Be confident with mental strategies from Year 3.

Add and subtract numbers mentally, including . . . (Number: Addition and Subtraction, Year 3)

Derive quickly doubles of multiples of 10 up to 500, e.g., 360 + 360. (Also multiplication.)

Add and subtract multiples of 10, 100 and 1,000 to two- and three-digit numbers, e.g., 6.2 + 200 or 435 - 90.

Written Methods

See Mathematics programmes of study: key stages 1 and 2: Mathematics Appendix 1 (formal methods)

Align numbers carefully in the correct place value columns.

Understand the value of each digit based on its column position, i.e., a 1 in the tens column is really 10.

Explain orally how a method of calculation works and demonstrate an understanding of the place value that underpins written methods.

Estimate the approximate range of where an answer will fall and use this to check for reasonableness.

Add numbers up to four digits accurately using a formal written columnar method.

Subtract numbers up to four digits accurately using a formal written columnar method.

Add two three-digit sums of money or measures, such as £4·21 and £3·87 by:

first adjusting them from pounds to pence.

finally using decimal notation.

Subtract two three-digit sums of money or measures, such as 7·50 m and 2·84 m by:

first adjusting them from metres to centimetres.

finally using decimal notation.

Estimate and use inverse operations to check answers to a calculation.

Estimate answers by rounding and then finding and comparing the exact answer, e.g., recognise that the answer to 367 + 185 is less than 400 + 200.

Check subtraction calculations using the inverse operation of addition.

Check addition calculations using the inverse operation of subtraction. (Could be on a number line.)

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Problem Strategies

Select an appropriate calculation method, e.g., use known facts to work out related facts, such as, 49 + 37 is equivalent to 50 + 37 – 1 or £1.99 + £2.99 is £2 + £3 – 2p.

Use notes, diagrams, organised tables and lists systematically to solve problems.

Adapt own method to become more efficient, such as in response to suggestions by others.

Identify which calculations need a written method and which can be done mentally.

Record and organise the stages of a problem neatly and systematically.

Problem Solving

Solve place value problems.

Solve number and practical problems . . . with increasingly large positive numbers. (Number and Place Value, Year 4)

Year 4 Mathematics Curriculum Objectives

Solve simple measure and money problems involving . . .decimals to two decimal places. (Number: Fractions, Year 4)

Solve two-step word problems for quantities, amounts and measures, e.g.:

For her party Alisha spent £2·88 on apples, £3·38 on bananas and £3·76 on oranges. Will a £10 note cover the cost?

Solve puzzles and undertake investigations involving addition and subtraction, e.g.:

Use numbers 37, 52, 77 and 87 to satisfy statements such as $X - y = 35$, or $x + y = 114$.

Predict the next term in a sequence such as £1·37, £1·47, £1·57

How many different ways can you complete 7□□+ □8 = 1□□□ or □□□ – 47 = □9?

Which numbers up to 50 they can make by adding three consecutive numbers?

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4
Multiplication & Division
Multiplying together three numbers
Know when a number is multiplied by 0 the answer is always 0.
Know when a number is multiplied or divided by 1, the answer is the same as the number being multiplied or divided.
Know that multiplication can be done in any order (commutativity) and use this to simplify multiplication calculations where there are three or more numbers, i.e.: Place together digits that make a multiple of 10, e.g., 6 × 9 × 5 becoming 6 × 5 × 9 so that 30 can easily be multiplied by 9. Re-order so that known 12 × 12 table facts can be applied, e.g., 4 × 9 × 3 is easier when arranged as 4 × 3 × 9.
Double and halve multiples of 10 and 100, e.g., Double 60 or 500, halve 80 or 300.
Double two-digit numbers using the most significant digit strategy and find corresponding halves, i.e., double the tens, double the ones, and add them together.
Extend multiplication and division facts derived from times tables, e.g.: 3 × 9 to 3 × 900. 24 ÷ 6 to 240 ÷ 6.
Estimate the approximate outcome of a multiplication or division calculation, e.g., 38 × 9 is a bit less than 40 × 10 = 400.
Check answers for sense against estimations.
Recognise and use factor pairs and commutativity in mental calculations. (Number: Multiplication and Division, Year 4)
Recall multiplication and division facts for multiplication tables up to 12 x 12.
Steps to knowing the 6× table:
Recite the times table fluently forwards and backwards.
Write the times tables in ascending and descending order.
Know by heart the multiplication and division facts.
Use the 6× table facts confidently in calculations.
Steps to knowing 9× table:
Recite the times table fluently forwards and backwards.
Write the times tables in ascending and descending order.
Know by heart the multiplication and division facts.
Use the 9× table facts confidently in calculations.
Steps to knowing 7× table:
Recite the times table fluently forwards and backwards.
Write the times tables in ascending and descending order.
Know by heart the multiplication and division facts.
Use the 7× table facts confidently in calculations.
Steps to knowing the 11× table:
Recite the times table fluently forwards and backwards.
Write the times tables in ascending and descending order.
Know by heart the multiplication and division facts.
Use the 11× table facts confidently in calculations.

Year 4 Mathematics Curriculum Objectives

Steps to knowing the 12× table:

Recite the times table fluently forwards and backwards.

Write the times tables in ascending and descending order.

Know by heart the multiplication and division facts.

Use the 12× table facts confidently in calculations.

Immediately recall 2, 3, 4, 5, 8 and 10 multiplication and division facts (from Year 3).

Recognise the relationship between the 3×, 6× and 12× tables and use doubling and halving strategies to derive answers.

Know some divisibility rules and use them to check, e.g.:

If the sum of the digits is divisible by 3 then the number is divisible by 3, e.g., 660.

If the sum of the digits is divisible by 9 then the number is divisible by 9, e.g., 351.

Recognise and show, using diagrams, families of common equivalent fractions. (Number: Fractions, Year 4)

Multiplying by 0 and 1

Know when a number is multiplied by 0 the answer is always 0.

Know when a number is multiplied or divided by 1, the answer is the same as the number being multiplied.

Know that multiplication can be done in any order (commutativity) and use this to simplify multiplication calculations where there are three or more numbers, i.e.:

Place together digits that make a multiple of 10, e.g., 6 × 9 × 5 becoming 6 × 5 × 9 so that 30 can easily be multiplied by 9.

Re-order so that known 12 × 12 table facts can be applied, e.g., 4 × 9 × 3 is easier when arranged as 4 × 3 × 9.

Double and halve multiples of 10 and 100, e.g., Double 60 or 500, halve 80 or 300.

Double two-digit numbers using the most significant digit strategy and find corresponding halves, i.e., double the tens, double the ones, and add them together.

Extend multiplication and division facts derived from times tables, e.g.:

3 × 9 to 3 × 900.

24 ÷ 6 to 240 ÷ 6.

Estimate the approximate outcome of a multiplication or division calculation, e.g., 38 × 9 is a bit less than 40 × 10 = 400.

Check answers for sense against estimations.

Recognise and use factor pairs and commutativity in mental calculations. (Number: Multiplication and Division, Year 4)

Dividing by 1

Know when a number is multiplied by 0 the answer is always 0.

Know when a number is multiplied or divided by 1, the answer is the same as the number being multiplied or divided.

Know that multiplication can be done in any order (commutativity) and use this to simplify multiplication calculations where there are three or more numbers, i.e.:

Place together digits that make a multiple of 10, e.g., 6 × 9 × 5 becoming 6 × 5 × 9 so that 30 can easily be multiplied by 9.

Re-order so that known 12 × 12 table facts can be applied, e.g., 4 × 9 × 3 is easier when arranged as 4 × 3 × 9.

Double and halve multiples of 10 and 100, e.g., Double 60 or 500, halve 80 or 300.

Double two-digit numbers using the most significant digit strategy and find corresponding halves, i.e., double the tens, double the ones, and add them together.

Extend multiplication and division facts derived from times tables, e.g.:

3 × 9 to 3 × 900.

24 ÷ 6 to 240 ÷ 6.

Estimate the approximate outcome of a multiplication or division calculation, e.g., 38 × 9 is a bit less than 40 × 10 = 400.

Year 4 Mathematics Curriculum Objectives

Check answers for sense against estimations.

Recognise and use factor pairs and commutativity in mental calculations. (Number: Multiplication and Division, Year 4)

Recognise and use factor pairs and commutativity in mental calculations.

Mental calculations can include jottings.

Use place value, known and derived facts to multiply and divide mentally, (Number: Number and Place Value, Year 4)

Know that multiplication can be done in any order (commutativity).

Break down or combine numbers into units that are easy to work with, including factor pairs, using:

the commutative law for multiplication, e.g., 5 × 9 can be worked out as 9 × 5;

the associative law for multiplication, e.g., (5 × 9) × 4 can be grouped and calculated differently as (5 × 4) × 9;

the distributive law of multiplication, e.g., 5 × 18 = 5 × 2 × 9;

adjustment by spotting 'nearly' numbers, e.g., 6 × 19 is almost 6 × 20.

Use factor pairs and other strategies (commutativity, distributivity) when multiplying more difficult numbers together, e.g.:

5 × 36 = 5 × 9 × 4 = (5 × 4) × 9 = 20 × 9 = 180.

5 × 36 = (30 × 5) + (6 × 5) = 150 + 30 = 180.

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

See Mathematics programmes of study: key stages 1 and 2: Mathematics Appendix 1 (formal methods).

Compare methods of multiplication and demonstrate understanding of place value of the digits, the process, advantages and disadvantages, e.g., grid multiplication, extended columnar multiplication.

Accurately record the outcome of multiplying a two-digit number by a one-digit number.

Accurately record the outcome of multiplying a three-digit number by a one-digit number.

Estimate and check answers for sense.

Use formal written methods for multiplication of TU × U.

Use formal written methods for multiplication of HTU × U. (See key messages.)

Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Solve multiplication word problems including those that require distributive law to solve them, e.g.:

Chews are 7p each. How much would it cost for 45 chews?

Janet started swimming lessons and was told it cost £3 a day. After 9 weeks of going every day she decided she didn't want to go any more. How much did she have to pay?

If 85 straws that are 8 cm long each are laid end to end how far will they reach?

Complete positive integer scaling problems, e.g.:

To make one cake I use 3 eggs, 8 cups full of flour, 8 cups of sugar and 1 pack of butter. How much of each ingredient would I need 3 for cakes?

A square has sides of 5 cm. Construct a square that is 5 times smaller / 3 times bigger, etc.

A giant is 100 times bigger than you. How wide is the giant's hand span?

Complete correspondence (relationship) problems, e.g.:

The lunch menu has 2 starters, 3 main courses and 2 sweets. On how many days could I have a different menu if I had one of each course each time?

Explain how a problem has been solved.

Solve number properties problems and puzzles, e.g.:

Find a pair of numbers with a sum of 11 and a product of 30.

1, 2, 4, 8, □, □, □. What is the rule?

Year 4 Mathematics Curriculum Objectives

Make up your own sequence with a rule for a friend to solve.
Division Problems
There are no specific division problem solving objectives for Year 4: the following are suggestions only.
Use the distributive law to partition a calculation, e.g., 72 ÷ 6 = (60 ÷ 6) + (12 ÷ 6). Make decisions about rounding up and rounding down remainders after division according to the context, e.g., A box holds 6 cakes. How many full boxes of cakes can be made if there are 70 cakes? Tell me some division questions that have the answer 12. How did you work this out?
Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. (Number: Fractions, Year 4)

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4

Fractions (including decimals)

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

Fractions activities will still be largely practical.

Work on fractions with small denominators (2, 3, 5) which should have been covered in Year 3.

For each fraction family studied (could be matched to multiplication tables work):

Use apparatus to generate equivalent fractions, e.g., 1⁄4, 2⁄8 or 2⁄3, 4⁄6.

Recognise patterns in the numerators and denominators of equivalent fractions, e.g., if the fraction family is 3 the denominators go up or down in the 3x table.

Know which fraction is the first one in the family (lowest numerator and denominator possible), e.g., 5⁄25 is from the fifths (1⁄5) family.

Solve equivalent fraction problems, e.g.:

Complete a sequence of equivalent fractions / find the missing fraction.

Find / match equivalent fractions families in a set of cards.

Recall multiplication and division facts for multiplication tables up to 12 x 12. Number: Multiplication and Division, Year 4)

Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.

Check that understanding of tenths is secure from Year 3 objectives.

Count forwards and backwards in hundredths (1⁄100 and 0·01) between 0 and 1 and then beyond 1, e.g., counting sticks, number lines or number hoops.

Understand that when counting in hundredths, 100 hundredths is equivalent to 1, 200 hundredths is equivalent to 2, etc.

Understand that when one is divided into 100 equal parts each part is 1⁄100 and can also be written as 0·01, e,g., base 10 apparatus, number line.

Know how many hundredths there are in any number with up to two decimal places, e.g., 0·05 = 5⁄100, 0·37 = 37⁄100, 0·5 = 50⁄100, 1·07 = 107⁄100.

Understand that when a tenth is divided into 10 equal parts each part is 1⁄100, e.g., On a number line marked 0 to 1, one tenth is the same as ten hundredths and that fifty-seven hundredths is the same as five tenths and seven hundredths.

Partition and combine decimal numbers to two places, e.g., Use decimal arrow cards to establish that 4·58 = 4 + 0·5 + 0·08.

Understand the relationship between decimals and fractions, e.g., Sort a set of mixed fraction and decimal cards into >, < or = to 0·5.

Count in multiples of 6, 7, 9, 25 and 1,000. (Place Value, Year 4)

Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non unit fractions where the answer is a whole number.

Relate division to fractions, e.g., ^{1/}3<sub/> of 24 is equivalent to 24 ÷ 3 or <sup>24/₃ or 8.

Know that to find a unit fraction of an amount, the amount is divided by the denominator, e.g., $^{1}/_{8}$ of 64 is 64 objects equally shared between 8 sets or 64 ÷ 8.

Understand the order of calculation for finding non-unit fractions of quantities, i.e., find the unit fraction of a quantity first by division then find the non-unit fraction by multiplication of the unit fraction quantity.

Solve fraction problems, e.g.:

Put these in ascending order: ^{2/}₉ of 18, ^{6/}<sub>7<sub> of 49, ^{5/}₈ of 24.

$^{2}/_{3}$ or a number is 12. What is the number?'

Investigate a non-unit fraction, recording in pictures, diagrams, words and calculations what you know about it, e.g., $^{3}/_{4}$,$^{2}/_{3}$.

Maisie eats $^{2}/_{3}$ of her 36 sweets and Aaron eats 4⁄5 of his 20 sweets. How many have they eaten altogether?

Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. (Number: Multiplication and Division, Year 4)

Add and subtract fractions with the same denominator.

Year 4 Mathematics Curriculum Objectives

Pupils may need to use practical apparatus and diagrams throughout this objective.

Add and subtract fractions with the same denominator, e.g., Sam and Alisha both eat 5⁄8 of their own pizza, how much have they eaten altogether?

Record outcomes of practical work with fractions in written equations.

Know that to add or subtract a fraction with the same denominator the numerator changes but the denominator does not.

Use inverse operations to check answers.

Add and subtract fractions with the same denominator in practical contexts, e.g.:

Alex eats 1 1⁄2 pizzas and John eats ½ a pizza. How many pizzas are eaten?

Ian buys a 1 litre bottle of pop. He drinks 1⁄4 of the bottle and spills 1⁄4 of the bottle. How many millilitres are left?

Recognise and write decimal equivalents of any number of tenths or hundredths.

Also use fractional notation if appropriate.

Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones). (Number: Humber and Place Value, Year 4)

Write decimal equivalents for tenths, e.g.:

6 tenths can be written as 0.6 (place holding zero).

$\frac{1}{10}$ of 4 cm is 0·4 cm.

0·3 m is $\frac{3}{10}$ of 1 m.

$\frac{57}{10}$= 5·7.

Know that fractions with a denominator of 10 can be converted to their decimal equivalent by placing the digits of the numerator in the tenths column, using number lines, etc., to support this, e.g., $\frac{3}{10}$ = 0·3.

Write decimal equivalents for hundredths, e.g.:

33 hundredths can be written as $\frac{33}{100}$ or 0·33.

5 hundredths can be written as $\frac{5}{100}$ or 0·05 (place holding zero).

$\frac{1}{100}$ of 4 cm is 0·04 cm.

0·14 m is $\frac{14}{10}$ of 1 m.

Know that fractions with a denominator of 100 can be converted to their decimal equivalent by placing the digits of the numerator in the appropriate column, using number lines, etc., to support this, e.g., $\frac{7}{100}$ = 0·07, $\frac{13}{100}$ = 0·13.

Write any number expressed as a number and fraction with tenths or hundredths as a decimal number, e.g., $\frac{57}{100}$ = 5·47 or $\frac{547}{10}$ = 54·7

Understand the relationship between equivalent fractions and decimals, e.g., Sort a set of cards into equivalent fraction families, such as 0.1, $\frac{1}{10}, \frac{2}{20}, \frac{70}{100}$ as one family.

Recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$.

Count forwards and backwards in 25s.

Count forwards and backwards in 0·25s, recognising that we say 'nought point two five' and not 'nought point twenty-five'.

Count in quarters, initially using improper fractions (0, $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}$ …) and then changing these to mixed numbers (0, $\frac{1}{4}$, $\frac{2}{4}, \frac{3}{4}$, 1, $1\frac{1}{4}$….).

Visualise counting in 0·25s and $\frac{1}{4}$s together and know equivalences, e.g., Show them on the same number line.

Recall that $\frac{1}{4}$ is 0·25, $\frac{1}{2}$ is 0·5 and $\frac{3}{4}$ is 0·75 and relate this to measures, e.g., $\frac{3}{4}$ of a metre is 0·75 m.

Find the effect of dividing a one- or two digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.

The initial use of calculators could support this objective.

Although this objective is only for division, it makes sense to do multiplication of decimals by 10 and 100 alongside this and use inverse operations to check answers.

Know the place value of each digit in any number up to 1,000, including those with up to two decimal places, e.g., 'What does the 6 represent in 1·65 m?'

Year 4 Mathematics Curriculum Objectives

Know that when dividing by 10 the digits all move one place to the right (and when multiplying by 10 they all move one place to the left), e.g.:

73 ÷ 10 = 7·3.

6 ÷ 10 = 0·6.

Know when 0 is used as a place holder.

Know that when dividing by 100 the digits all move two places to the right (and when multiplying by 100 they all move two places to the left), e.g.:

49 ÷ 100 = 0·49.

6 ÷ 100 = 0·06.

Apply division of 10 and 100 in context, e.g.:

What will the next number be in this sequence – 23·6, 2·36, ▢?

Find the missing number in 42 ÷ ▢ = 4·2.

Round decimals with one decimal place to the nearest whole number.

Be able to describe how to find or place decimals to one decimal place on a number line.

Be able to say, first with visual support then without, which is the nearest whole number to a number with one decimal place on a number line.

Know, when rounding numbers with one decimal place, four-tenths or less rounds to the previous integer and five-tenths or more to the next integer.

Use rounding of numbers to estimate answers, e.g., 56·4 + 33·7 is approximately 56 + 34.

Compare numbers with the same number of decimal places up to two decimal places.

Order a series of one place decimal numbers by comparing whole numbers and tenths in that order, e.g., in the context of measures.

Order a series of two place decimal numbers by comparing whole numbers, tenths and hundredths in that order, e.g., in the context of measures or money.

Use < > and = to show inequalities and equivalence between decimal numbers, e.g., Using numbers with at least one decimal place make this statement true ▫ < ▫ > ▫.

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

Solve money problems with fractions, e.g., Max has £48. He spends ¾ of it. How much has he got left? (Pupils might realise that they have ¼ left from knowing that ¾ and ¼ totals 1.)

Solve money problems with decimals, e.g., Jim has £5 and buys an assortment of sweets for £2·65. How much change does he receive?

Solve measures / quantities problems with fractions, e.g., Order measures that have decimal places, e.g., ¾ of 1 m, ½ of 1·4 m and 3/5 of 1 m.

Solve measures / quantities problems with decimals, e.g., A ribbon is 18 cm long. If it was divided into 10 equal parts how long would each piece be?'

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. (Number: Addition and Subtraction, Year 4)

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4

Measurement

Convert between different units of measure [for example, kilometre to metre; hour to minute].

Understand the meaning of kilo (one thousand), centi (one hundredth) and milli (one thousandth) and use this to work out conversions between units, e.g., 'How many metres are in 8 kilometres?'

Convert between units in each area of measure, e.g.:

How many minutes in 1 1⁄2 hours?

Write 5,678 ml in l.

Which is the most: a large 0·145 kg of chocolate or 5 small bars that are 30 g each?

The length of one side of a square in 40 cm. What is the perimeter in metres?

Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.

Rectilinear shapes are where each interior angle is either 90° or 270°.

Work in Year 5 uses the language of 'composite' rectilinear shapes so it is suggested that here a rectilinear shape is either a rectangle or a maximum of two rectangles combined into one shape.

Be able to explain what perimeter means.

Measure the perimeter of large and small rectilinear areas / objects (including squares and rectangles), e.g., the flower bed, a reading book, a shape drawn on squared or plain paper.

Understand the relationship between the four sides of a rectangle and the perimeter of (2 × width) + (2 × length), e.g., Children measure and systematically record the lengths of sides and the perimeter of several rectangles in a table.

Calculate the perimeter of a square from one side length in m / cm.

Calculate the perimeter of rectangles from two known measurements in m and cm.

Measure the perimeter of rectilinear shapes, such as an object, a shape on grid paper, a shape on plain paper.

Calculate the perimeter of rectilinear figures, not necessarily drawn to scale, from some known measurements in m / cm.

Solve perimeter problems, e.g.:

The perimeter of the quadrangle is 40 m. What could the lengths of its sides be assuming each side is in whole metres only?

Draw different rectilinear figures with a perimeter of . . ..

Find the area of rectilinear shapes by counting squares.

Understand the terms centimetres squared and metres squared (not necessarily notation cm2 or m2).

Estimate and find the area of rectilinear shapes, including rectangles, drawn on cm2 paper by counting squares.

Find the approximate area of larger surfaces, e.g., Use a one metre squared construction, such as one made by binding 4 metre sticks together.

Estimate, compare and calculate different measures, including money in pounds and pence.

Round any number to the nearest 10, 100 or 1,000. (Number and Place Value, Uear 4)

Round measures in context, e.g.:

The weight of the tin of biscuits is approximately 500 g.

The length of the playground is approximately 50 m.

Read a range of partly numbered scales to the nearest division by calculating each interval.

Record measurements using decimal notation and relating the whole number, tenths, hundredths and thousandths to parts of the measure being used.

Compare two or more measures, e.g.:

Which has the biggest area, the classroom or the library area?

Which of the jars of liquid is the warmest, the syrup or the chocolate?

Put the objects in the box in order by mass.

Year 4 Mathematics Curriculum Objectives

Pupils make a line in height order. Make comparisons, such as, Half the class are taller than 1·3 m.

Estimate a more challenging range of measures and check the outcome, e.g.:

How far do you think you threw the beanbag?

Solve measurement problems, e.g.:

Who has the longest stride in your group?

What is the capacity of the flower vase? Find something else that will hold a similar amount?

The maximum weight load of a bag before it might break is 2 kg. Which pair of objects could you fit safely into the bag and be sure it would not break?

This is one face of a Rubik's cube? How many individual cubes do you think you would need to make the whole cube? How did you work it out?

Solve temperature problems, e.g.:

Compare indoor and outdoor temperatures.

Find changes in temperature over time.

Use calculation strategies to solve one- and two-step money problems, e.g.:

Buy more than one item, totalling, calculating change from £10;

Estimate how much money is in a set of coins;

Estimate prices to the nearest £1, £10, £100, e.g., 'Approximately how much would you need to by 2 bottles of coke and a bag of crisps?'

Who has the most?

How much more / less does Jim have than Robbie?

Read, write and convert time between analogue and digital 12- and 24-hour clocks.

Relate analogue time to 12-hour digital time, e.g., make number pairs with a total of 60 and discuss equivalences such as 2:46, 46 minutes past 2 and 14 minutes to 3

Use both analogue and digital clocks alongside each other to illustrate the same time, e.g., Use a TV schedule to find out the starting time of a programme and showing this on a clock face.

Clarify times by using a.m. or p.m. notation where necessary in written and oral work.

Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

Understand that the units of time are not decimal, so care needs to be taken with time calculations.

Recall the relationships between seconds, minutes, hours, days, weeks, months and years.

Know further time relationships, including:

weeks to months and years;

months to years;

days in a year.

Use calendars to work out time intervals that cross a month boundary.

Use calendars to work out time intervals that cross a year boundary.

Solve problems, e.g.:

The cake went in the oven at 1:35. It cooked for 40 minutes. What time did it come out?

Use timetables and TV guides.

Work out how many days are remaining to the next holiday.

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4
Geometry : Properties of Shapes
Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
Name and sort four-sided polygons by their properties, including rectangles, squares, parallelograms, rhombuses, trapezoids, kites, quadrilaterals, e.g., Select those with at least one pair of parallel sides, naming each and recognising that some shapes can have more than one name, e.g., a square is a rectangle
naming each and recognising that some shapes can have more than one name, e.g., a square is a rectangle.
Name and sort triangles by their properties, including, equilateral, isosceles, right angled and scalene triangles, e.g., Create as many different triangles as possible using pencil and paper, geoboards or ICT and sort them.
Sort 2-D and 3-Dshapes, using criteria such as regular / irregular, parallel lines, number of edges, concave / convex, shapes of faces, number of vertices.
Record classifications and justify reasoning, e.g., Venn and Carroll diagrams.
Solve shape problems, e.g.:
Draw / sketch and name polygons and some 3-D shapes, e.g., on isometric paper.
Investigate tetrahedrons, e.g., counting faces, edges and vertices, by unfolding a 3-D model in as many different ways as possible.
How many different triangles / quadrilaterals can be seen in a picture?
Starting with a rectangular sheet of paper, fold it one or more times and then make one straight cut to make a new shape such as a hexagon.
Identify acute and obtuse angles and compare and order angles up to two right angles by size
Recognise and use the correct terminology for angles that are acute, obtuse or a right angle.
Estimate, order and check a set of angles (each less than 180^0).
Solve angle problems, e.g., Find the maximum number of right angles that could be in a triangle, a quadrilateral, a pentagon, etc.
Identify lines of symmetry in 2-D shapes presented in different orientations.
Identify one or more lines of symmetry of shapes in different orientations.
Solve symmetry problems, e.g.:
The number of lines of symmetry in a regular polygon is equal to the number of sides of the polygon. Is this true? Draw a hexagon with no lines / one line / two lines of symmetry.
Complete a simple symmetric figure with respect to a specific line of symmetry.
Complete patterns and reflect simple shapes along a vertical, horizontal or other line of symmetry using a variety of approaches, such as counting squares, a mirror, tracing paper, ICT. Pupils may rotate their drawings to make the completion of the shape easier.
Reflect shapes where not all the sides of the shape are parallel or perpendicular to the mirror line but the mirror line is parallel to one of the axes (on squared paper).
Solve symmetry problems, e.g.:
How many different symmetrical patterns can you make with any or all of these shapes? Make as many different shapes as possible with 5 squares joined together (pentominoes). Draw the reflective lines of symmetry on those that have them.

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4
Geometry: Position & Direction
Describe positions on a 2-D grid as coordinates in the first quadrant.
Lettered and Numbered Grids
Identify / name the horizontal axis (x) and the vertical axis (y).
Place objects in a numbered and lettered grid, e.g., Put the horse in square A5.
Follow instructions to draw / colour in squares on a grid with the rows labelled A, B, C, etc., and
columns labelled 1, 2, 3, etc., e.g., pPay 'Battleships'.
Explain the position of objects on a grid using letters and numbers, e.g., give instructions for a friend to draw an identical picture to their own on a grid.
Co-ordinate Grids
Know the functions and names of each element of the co-ordinate grid including:
x-axis and y-axis;
axis labels;
scaling in equal divisions and on the lines, not in the spaces;
first quadrant.
Know that counting of scales starts from the origin (where the x and y axes cross).
Be able to give an xy co-ordinate for a point on a grid.
Be able to explain why (4, 1) is not the same as (1, 4).
Solve grid problems, e.g.:
On a grid, can you plot a triangle with a line of symmetry that does not have a right angle? Give the co-ordinates to a friend to check.
On a grid, join points where the lines cross to make a pentagon that has a right angle. Use a ruler. Write the co-ordinates for a friend to repeat your shape.
Give routes for moving on a 'diagonal grid' (see opposite), e.g., Facing NW make a 90^0 turn anti–clockwise, etc.
This could be linked to the 8 points of the compass and 45^0 angles.
Describe movements between positions as translations of a given unit to the left/right and up/down.
There is no requirement for pupils to draw translated shapes in Year 4.
Know that the term 'translate' means movement and could be up or down, left or right but the shape is not changed in any other way.
Understand that there are potentially two moves to translate a shape, but a shape might have only made one of these translations, i.e., a horizontal move and / or a vertical move.
From seeing two identical shapes on a co-ordinate grid, explain the translation, including for shapes that are not parallel or perpendicular to the axis.
Plot specified points and draw sides to complete a given polygon.
ICT can be used in some activities.
Draw a simple shape from written co-ordinate instructions, e.g., square or rectangle.
Write the co-ordinates of a simple shape for a friend to construct, e.g., triangle.
Draw and write instructions for more complex polygons / pictures.
Apply knowledge of co-ordinates to solve problems, e.g., Given some of the vertices of squares or rectangles, plot the missing points, recognising that there may be more than one solution to the problem.

Year 4 Mathematics Curriculum Objectives

Mathematics – Year 4
Statistics
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
Interpret and present information in the following formats over a period of time:
Pictograms for discrete data to compare between different groups, including those with part scaled pictures, such as, ½ a Smartie (scaled in 2s), 2/5 of an ice cream bar (scaled in 5s) or 4/10 of a letter (scaled in 10s).
Block graphs, both horizontal (bar) and vertical (column), for discrete data to compare between different groups.
Two-way frequency tables to look up data that has many items and outcomes.
Line graphs (time graphs), for continuous data comparing changes over the same period of time for more than one group.
Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. (Statistics, Year 4)
Use a greater range of scales, e.g., 2, 5, 10, 20, 50.
Understand the effect of changing the scale to different step sizes, how this impacts on bar heights and ease of interpretation, e.g., Type some data into Excel, make a bar chart and experiment with changing the y-axis scale major unit values.
Consistently use titles, axis labels, scales and keys,
where required, in all forms of data presentation.
Select an appropriate chart to present data and explain why choices have been made.
Draw conclusions based on statistical investigations; e.g., 'There always seem to be more yellow Smarties than any other colour. We've investigated 6 tubes and there were more yellow in every one.'
Discrete data (data that is counted)
Interpret discrete data by asking and answering questions; e.g.:
Which two winter sports are the most popular? How many letters were delivered from Monday to Thursday?
Present and interpret discrete data in a range of contexts and presentations; e.g., Investigate the colours and / or shapes in a mixed packet of balloons and answer questions such as, How many packets might you have to buy to get 10 long blue balloons?
Continuous data (data that is measured)
Interpret continuous data on a time graph by asking and answering questions; e.g., Find the temperature at different times of day, including those that are not exactly on a scale division on a line chart.
Draw a line / use a ruler on line graphs to make it easier to read information on the x- or y-axis.
Present and interpret continuous data in a range of contexts as line / time graphs; e.g.:
Measure and record the height of a sunflower at equal time intervals over time and make a line graph with the measurements. Answer questions and draw conclusions. Answer questions such as, Who takes the longest to get home from school?
Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
Solve problems, including those of comparison, sum and difference, presented in different data formats, including:
Pictograms; e.g., 'Is it true that there are 8 more yellow Smarties than brown ones in every tube?'
Block graphs; e.g., 'Which is the busiest hour of the day for traffic outside school?'
Lists; e.g., Use a price list to work out differences, totals and change.
Two-way frequency tables; e.g., Use a bus schedule to find which journey from two specified journeys takes the longest.
Line graphs; e.g., Plot the temperature of a cooling liquid at periodic intervals and find the difference in temperature at 10:00 a.m. and 2:00 p.m.
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Statistics, Year 4)