



Maths Makes Sense

5

Medium-term plan

OXFORD

Maths Makes Sense 5 Block 1

End-of-block objectives

Arithmetic 1

- ☆ Write two or three 4-digit whole numbers vertically and calculate (with more than one tricky column) using addition and subtraction
- ☆ Use the three operations, $+$ / $-$ / \div , with vulgar fractions or mixed numbers with the same denominator
- ☆ Multiply and divide vulgar fractions and mixed numbers by a whole number.

Geometry

- ☆ Name the images of objects that are points, line segments or polygons in a symmetrical shape
- ☆ Know the line of symmetry is the perpendicular bisector in a symmetrical shape
- ☆ Name two congruent shapes in a shape with an axis of symmetry.

Data and Measure

- ☆ Solve word problems (involving capacity, volume or length) by using a division Maths Story, identifying the basic Real-Life Story as a Type 1 or Type 2 division
- ☆ Solve word problems (involving capacity, volume or length) by finding a percentage of a value or the result of a percentage increase or decrease
- ☆ Choose the correct operations to solve one-step and multi-step word problems involving capacity, volume or length
- ☆ Make a simple 3D shape by drawing, cutting out and folding a net
- ☆ Recognise that a cube cut through one diagonal forms two congruent triangular prisms.

Arithmetic 2

- ☆ Complete missing number grids and missing number sentences
- ☆ Complete sequences involving square numbers
- ☆ Use information displayed in grids to solve word problems
- ☆ Solve one- and two-step word problems involving any of the four operations.

Reasoning

- ☆ Write a.m./p.m. times using 24-hour clock notation
- ☆ Write 24-hour times as a.m./p.m. times
- ☆ Calculate the mean number of days in four consecutive years
- ☆ Calculate the duration between two times written using 24-hour notation.

Daily practice

Grade 13

- ☆ Practise adding and taking away up to and from a total of 100 with pounds/pence
- ☆ Practise multiplication and division facts from times tables (up to 12)
- ☆ Give multiples of 11 and 12 and factors of 12, 18, 25, 33 and 36
- ☆ Give the value of underlined decimal digits
- ☆ Name a quadrilateral, polygon and triangle
- ☆ Calculate angles using the sum of angles at a point, vertically opposite and supplementary angles
- ☆ Convert times from the 12-hour to the 24-hour clock, g to kg, ℓ to ml, cm to m, km to m and fractions to decimals
- ☆ Find the possible values of a whole number with given conditions
- ☆ Find a fraction of a whole number and equivalent fractions
- ☆ Find the mode and median of a data sample
- ☆ Chant times tables
- ☆ Use one step for addition of three numbers and two steps for combining addition and subtraction
- ☆ Use compasses to draw the perpendicular bisector of a line segment
- ☆ Use 'Think About the Word Problem!' to solve a problem that involves capacity
- ☆ Identify the type of problem, question or instruction and use any of the four operations to solve the problem
- ☆ Write a.m. and p.m. times as 24-hour times, complete a list of the number of days in consecutive years
- ☆ Calculate accurately with fractions and mixed numbers
- ☆ Name the image and recognise congruent shapes for a specified 'object' (point, line or polygon) on one side of the axis of symmetry
- ☆ Calculate durations using 24-hour clock notation
- ☆ Complete the questions on the 'I can' pages in Progress Book 5A
- ☆ Discuss achievements in Progress Book 5A and fill in the chart

Resources

Maths Makes Sense Toolkit

- ☆ Whole cups, fifths, tenths and decimals cards, pupil tables, fraction cards

Other

- ☆ Lined, cm-squared, $\frac{1}{2}$ cm-squared and plain exercise books, calculators, compasses, short pencils, 15-cm rulers, set squares, flipchart, classroom clock, geared clock, A4 cm-squared paper, scissors, adhesive tape, 1-cm³ cubes, board compasses

Cross-curricular links

Art, Design and Technology

- ☆ Geometry: make models using named 3D shapes and drawing, cutting out and folding nets

PSHCE

- ☆ Progress Books 'I can' pages: practise turn-taking and listening skills when discussing achievements in Progress Books

Key vocabulary

perpendicular bisector • arc • fair swap • axis of symmetry • square numbers • leap year • congruent

Maths Makes Sense 5 Block 2

End-of-block objectives

Arithmetic 1

- ☆ Write two or three 4-digit decimal numbers vertically, with up to three decimal places, and calculate with more than one tricky column, using addition and subtraction
- ☆ Multiply two vulgar fractions where the denominator of one and the numerator of the other are equal.

Geometry

- ☆ Name and draw acute angles, obtuse angles, reflex angles and right angles
- ☆ Name and calculate vertically opposite angles and supplementary angles
- ☆ Use a protractor to draw acute angles, obtuse angles and right angles.

Data and Measure

- ☆ Appreciate the need for standard units
- ☆ Know the metric units of mass: g, kg; length: mm, cm, m, km; and volume/capacity: ml, ℓ , cm^3 , m^3
- ☆ Know imperial units of measure, e.g. pound, ounce, inch, foot, yard, mile, pint, gallon
- ☆ Interpret a reading that lies between two unnumbered divisions on a scale
- ☆ Convert between metric units, e.g. kg and g to kg
- ☆ Convert between imperial units, e.g. lb and oz to oz.

Arithmetic 2

- ☆ Use $>/</\geq/\leq$ with positive whole numbers, e.g. in the form $8 < m < 10$
- ☆ Use a calculator to check if a number is a factor of another number
- ☆ Distinguish between a factor and a proper factor.

Reasoning

- ☆ Solve algebraic equations that have an expression which is the sum of two terms using algebraic methods, one term being solely 'x' and the other term a 1-digit number, e.g. $x + 2 = 5$
- ☆ Solve algebraic equations that have an expression which consists of one term using algebraic methods, a product of 'x' and a 1-digit number, e.g. $2x = 6$.

Daily practice

Grade 14

- ☆ Practise adding and taking away up to and from a total of 100 with pounds/pence
- ☆ Practise multiplication and division facts from the 11 and 12 times tables.
- ☆ Give multiples of 7, 8, 9 and factors of 16, 24, 25, 30 and 49
- ☆ Convert times from the 12-hour to the 24-hour clock, find times after a given time using the 12-hour clock
- ☆ Convert km to m, cm to m, g to kg, to ml and mixed fractions to decimals
- ☆ Give the value of underlined decimal digits
- ☆ Name polygons and triangles
- ☆ Calculate an angle using supplementary and vertically opposite angles
- ☆ Find a fraction or a percentage of a whole number
- ☆ Find equivalent fractions
- ☆ Place decimal fractions on a number line
- ☆ Find the possible values of a whole number with given conditions
- ☆ Convert between fractions, percentages and decimals
- ☆ State doubles
- ☆ Round to the nearest 100
- ☆ Chant times tables
- ☆ Use one step for addition of three numbers with up to three decimal places, and two steps for combining addition and subtraction
- ☆ Identify and name right angles and straight lines and say and write their magnitude, 90° and 180° . Identify acute, obtuse and reflex angles
- ☆ Identify metric and non-metric units of measure
- ☆ Solve puzzles that use the symbols $<$ and $>$ and recognise explicit and implicit factors
- ☆ Draw two Maths Tables and solve equations with addition on the left-hand side (LHS)
- ☆ Calculate products of vulgar fractions and vertical addition and subtraction with up to three decimal places
- ☆ For angles drawn in a circle, identify acute, obtuse and right angles
- ☆ Draw two Maths Tables and solve equations with multiplication on the left-hand side (LHS)
- ☆ Complete the questions on the 'I can' pages in Progress Book 5A
- ☆ Discuss achievements in Progress Book 5A and fill in the chart

Resources

Maths Makes Sense Toolkit

- ☆ Pupil tables, pupil negative number cards, pupil \times cards, coloured ratio sticks, plain ratio sticks (long and medium)

Other

- ☆ Lined, plain and $\frac{1}{2}$ cm-squared exercise books, calculators, 15-cm rulers, coloured pencils, balance scales, parcel for weighing, objects of different masses, flipchart, graph paper, rulers, glue, sticky tape, protractors, variety of analogue weighing scales and spring balances, compasses, small pencils

Cross-curricular links

Science

- ☆ Data and Measure: use the vocabulary and actions for centimetre and decimetre when measuring length, and kilograms and grams when measuring mass

PSHCE

- ☆ Progress Books 'I can' pages: practise turn-taking and listening skills when discussing achievements in Progress Books

Key vocabulary

acute • reflex • obtuse • metric • imperial

Maths Makes Sense 5 Block 3

End-of-block objectives

Arithmetic 1

- ☆ Use $\frac{a}{b}$ and $a \div b$ interchangeably, e.g. $\frac{5}{8}$ and $5 \div 8$
- ☆ Use the division button on a calculator to convert vulgar fractions to finite decimal fractions (no vulgar fractions with infinite decimal equivalents)
- ☆ Use the four operations (+/-/×/÷) with combinations of positive and negative numbers, including tricky examples (but not the product of two negative numbers).

Geometry

- ☆ Use a calculator to calculate the circumference of a circle using $C = \pi \times d$
- ☆ Use a calculator to calculate the area of a circle using $A = \pi \times r^2$.

Data and Measure

- ☆ Interpret a calendar
- ☆ Interpret a timetable
- ☆ Use durations of minutes, hours, days or months in calculations and word problems
- ☆ Construct a bar chart and use it to find the mode
- ☆ Understand that the mode is the most common value in a set of data.

Arithmetic 2

- ☆ Use divisibility tests for 2, 3, 4, 5, 6, 10
- ☆ Distinguish between factors and proper factors.

Reasoning

- ☆ Solve problems involving measures and fractions by exploring patterns and relationships in diagrams
- ☆ Solve one-, two- and three-step word problems involving money.

Daily practice

Grade 15

- ☆ Practise adding and taking away up to and from a total of 100 with pounds/pence
- ☆ Practise multiplication and division facts from times tables (up to 12)
- ☆ Name multiples of 4, 7 and 8 and factors of 12, 20, 25, 30, 35 and 36
- ☆ Convert km to m, cm to m, g to kg and to ml
- ☆ Give the value of underlined decimal digits
- ☆ Demonstrate knowledge of factors
- ☆ Convert percentages to decimals
- ☆ Name a polygon and a triangle
- ☆ Calculate angles using the sum of angles at a point, supplementary and vertically opposite angles
- ☆ Name doubles
- ☆ Find times before a given time using the 24-hour clock
- ☆ Find a time earlier than a given digital time
- ☆ Convert the 12-hour to a 24-hour clock
- ☆ Find equivalent fractions
- ☆ Convert between fractions, decimals and percentages
- ☆ Find the mode and median of a data sample
- ☆ Round to the nearest 100
- ☆ Chant times tables
* * * * *
- ☆ Express division of whole numbers as fractions
- ☆ Write a multiplication Maths Story, using decimals to 2 decimal places to calculate areas of rectangles
- ☆ Use a calendar to find specific dates
- ☆ Write factors and proper factors, and use divisibility test for 2
- ☆ Solve a two-step problem using money
- ☆ Use diagrams to see fraction and decimal equivalents
- ☆ Use a calculator to calculate the circumference of a circle using
- ☆ $C = \pi \times d$ and the area of a circle using $A = \pi \times r^2$
- ☆ Solve problems using Maths Stories with several terms, some of the terms being products
- ☆ Complete the questions on the 'I can' pages in Progress Book 5B
- ☆ Discuss achievements in Progress Book 5B and fill in the chart

Resources

Maths Makes Sense Toolkit

- ☆ Whole cups, pupil tables, negative number cards (-1, 0, 1)

Other

- ☆ Lined, plain, $\frac{1}{2}$ cm-squared and cm-squared exercise books, calculators, calendars, flipchart, coloured pencils, rulers, compasses, small pencils, 15-cm rulers

Cross-curricular links

Geography

- ☆ Data and Measure: design and carry out a survey of the class. Present the results as a bar chart, including identifying the mode

PSHCE

- ☆ Progress Books 'I can' pages: practise turn-taking and listening skills when discussing achievements in Progress Books

Key vocabulary

mode • circumference • diameter • radius • π ('pi') • fair swap • term • factor • product

Maths Makes Sense 5 Block 4

End-of-block objectives

Arithmetic 1

- ☆ Use a grid for long multiplication with up to 2-digit by 2-digit whole numbers
- ☆ Use a grid for long multiplication with up to 3-digit by 2-digit decimal numbers (one or two decimal places), with answers up to three decimal places.

Geometry

- ☆ Recognise corresponding angles and know they have the same value
- ☆ Recognise vertically opposite angles and know they have the same value
- ☆ Recognise opposite interior angles in a parallelogram and know they have the same value.

Data and Measure

- ☆ Interpret a distance-time graph
- ☆ Draw a distance-time graph from given information
- ☆ Round measures of distance and time.

Arithmetic 2

- ☆ Identify prime numbers from 0–100 using Eratosthenes' sieve.
- ☆ Write numbers as the product of their prime factors
- ☆ For n as a positive whole number, respond to a condition that describes a factor, e.g. 11 is a factor of n , and conditions that use the symbols $<$ or \leq , e.g. $22 < n < 55$, and write a value of n , i.e. 33 or 44.

Reasoning

- ☆ Solve puzzles by calculating quantities, e.g. numbers of bricks, and dimensions, e.g. lengths and heights, using pictures of 2D and 3D shapes.

Daily practice

Grade 16

- ☆ Practise adding up to a total of 100 with pounds/pence
- ☆ Practise multiplication and division facts from times tables (up to 12)
- ☆ Name multiples of 4, 12 and factors of 8, 18, 21, 27
- ☆ Find times after a given time and convert the 24-hour to the 12-hour clock
- ☆ Find a time earlier than a given 24-hour clock time
- ☆ Convert km to m, cm to m, g to kg and ℓ to ml
- ☆ Convert between fractions, decimals and percentages
- ☆ Name a polygon and a triangle
- ☆ Place decimal fractions on a number line
- ☆ Name doubles
- ☆ Give the value of underlined decimal digits
- ☆ Write prime numbers up to 30
- ☆ Find equivalent fractions
- ☆ Find a fraction of a whole number
- ☆ Calculate angles using supplementary and vertically opposite angles
- ☆ Name doubles
- ☆ Chant times tables
- * * * * *
- ☆ Use basic products in multiplication tables to derive products of large numbers and decimal fractions
- ☆ Identify vertically opposite angles and recognise they are the same size
- ☆ Interpret a distance–time graph
- ☆ Identify a prime number as having no proper factors
- ☆ Solve length puzzles by calculating diameters and side lengths
- ☆ Use grids for products of 3-digit and 2-digit numbers (both large numbers and decimal fractions) for rows of circles and squares
- ☆ Recognise and write values of vertically opposite, corresponding and opposite angles in a parallelogram
- ☆ For 3D pictures of shapes made with cubes, calculate quantities for shapes of different sizes
- ☆ Complete the questions on the ‘I can’ pages in Progress Book 5B
- ☆ Discuss achievements in Progress Book 5B and fill in the chart

Resources

Maths Makes Sense Toolkit

- ☆ Place value cards, plain ratio sticks

Other

- ☆ Lined, plain cm-squared and $\frac{1}{2}$ cm-squared exercise books, calculators, flipchart, 15-cm rulers, stopwatches or stop clocks, trundle wheels, large open space, camera, poster-making materials, interlocking 1-cm cubes, graph paper, rulers, glue or sticky tape

Cross-curricular links

Outdoor play/physical education

- ☆ Data and Measure: use a trundle wheel to measure out a length of track. Use a stop watch to time how long it takes to cover this distance by running, walking, hopping or skipping. Compare the results

PSHCE

- ☆ Progress Books ‘I can’ pages: practise turn-taking and listening skills when discussing achievements in Progress Books

Key vocabulary

distance-time graph • prime number • proper factor • diameter • parallelogram

Maths Makes Sense 5 Block 5

End-of-block objectives

Arithmetic 1

- ☆ Use a grid for long division including numbers with up to 3-digits divided by 1-digit whole numbers.

Geometry

- ☆ Draw a convex polygon
- ☆ Draw and mark the exterior angles for a convex polygon
- ☆ Show that the sum of the exterior angles of a polygon is 360° .

Data and Measure

- ☆ Use ratio to convert between metric units of measure
- ☆ Use ratio to convert between metric and imperial units of measure
- ☆ Estimate the area of a shape in cm^2 .

Arithmetic 2

- ☆ Evaluate terms in an expression with brackets, e.g. $(2 \times 3) + (1 \times 2) = 6 + 2$
- ☆ Evaluate products in an expression with brackets, e.g. $2 \times (4 + 1 \times 3) = 2 \times (4 + 3) = 2 \times 7$.

Reasoning

- ☆ Carry out investigations involving shapes, numbers and real-life situations using the 'What if Not' approach.

Daily practice

Grade 17

- ☆ Practise adding and taking away up to and from totals of 100 and £5.00 with pounds and pence
- ☆ Practise multiplication and division facts from times tables (up to 12)
- ☆ Multiply and divide by 20
- ☆ Give multiples of 20 and proper factors of 18, 28 and 36
- ☆ Convert m to mm, cm to m, kg to g and ℓ to ml
- ☆ Give the value of underlined decimal digits
- ☆ Find a fraction/percentage of a whole number
- ☆ Name a concave polygon
- ☆ Demonstrate knowledge of exterior angles of a polygon and interior angles of quadrilaterals, triangles, pentagons and hexagons
- ☆ Name doubles
- ☆ Give the value of underlined decimal digits
- ☆ Find a time earlier than a given time using the 24-hour clock
- ☆ Convert the 12-hour clock to the 24-hour clock
- ☆ Give prime numbers up to 40
- ☆ Find equivalent fractions
- ☆ Convert fractions to decimals and percentages
- ☆ Find the mode and median of a data sample
- ☆ Chant times tables
* * * * *
- ☆ Partition 3-digit numbers in a grid for long division
- ☆ Draw and label a convex quadrilateral, sketch and label a pentagon
- ☆ Convert units of distance from metric to imperial and vice versa
- ☆ Locate terms in an expression and say the value of each term
- ☆ Investigate the number of different shapes that can be made using congruent squares placed side to side
- ☆ Calculate $HTU \div U$ using a grid and write the remainder
- ☆ For a convex polygon, draw and mark the exterior angles and show that the sum of the exterior angles of a polygon is 360°
- ☆ Investigate the area and perimeter of rectangles made by placing squares side by side, 1 cm by 1 cm
- ☆ Complete the questions on the 'I can' pages in Progress Book 5C
- ☆ Discuss achievements in Progress Book 5C and fill in the chart

Resources

Maths Makes Sense Toolkit

- ☆ One dm stick per child

Other

- ☆ Lined, plain $\frac{1}{2}$ cm-squared and cm-squared exercise books, calculators, flipchart, 15-cm rulers, chalk, two blue pencils and one red pencil per child (or wallpaper and felt-tipped pens), two 1-metre rulers, compasses, short pencils, A4 $\frac{1}{2}$ cm-squared paper, large cards labelled 'A', 'B', 'C'

Cross-curricular links

Science

- ☆ Reasoning: use a trundle wheel to accurately measure the perimeter of school buildings and classrooms. Convert the measurements from metric to imperial

Art, Geography

- ☆ Reasoning: use congruent squares to make collages of the school and grounds

Key vocabulary

convex • concave • metric • imperial • term

Maths Makes Sense 5 Block 6

End-of-block objectives

Arithmetic 1

- ☆ Multiply decimal numbers with up to three decimal places by multiples of powers of 10 (product no more than three decimal places), using the 'logic of the language'
- ☆ Divide decimal numbers by multiples of powers of 10 (no numbers with more than three decimal places), using the 'logic of the language'
- ☆ Use derived products to calculate multiplication and division.

Geometry

- ☆ Recognise, name and sketch polygons (decagon, heptagon, hexagon, nonagon, octagon, pentagon, quadrilateral, triangle)
- ☆ Recognise, name and sketch a *equilateral* triangle, *isosceles* triangle, *right-angled* triangle, *scalene* triangle
- ☆ Recognise, name and sketch a *parallelogram*, *rectangle*, *rhombus*, *square*, *trapezium*
- ☆ Recognise the various special triangles and quadrilaterals, use the special name and recognise them as the more general polygons.

Data and Measure

- ☆ Calculate durations for times specified as a.m./p.m. times and 24-hour clock times
- ☆ Draw and use a double number line showing distance and time to solve word problems involving speed, distance and time
- ☆ Use calculations to solve word problems involving speed, distance and time.

Arithmetic 2

- ☆ Evaluate terms in an expression that includes brackets, e.g. recognise $5 + 4 + 2 \times 5$ as an expression with three terms, evaluate $5 + 4 + 10$ and recognise $5 + (4 + 2) \times 5$ as an expression with two terms and evaluate $5 + 30$
- ☆ Insert brackets in an expression so it has a specified value, e.g. calculate and write ' $2 \times 5 + 1 + 2 = 13$ and $2 \times (5 + 1) + 2 = 14$ ' and also insert brackets for $2 \times 5 + 1 + 2$ to have the value 16.

Reasoning

- ☆ Calculate durations of shop opening times from information in a grid
- ☆ Use information in a grid about duration of tracks on a CD to calculate differences between durations, total durations and mean durations
- ☆ Calculate equivalences and fractions of periods of time using years, days, hours, minutes and seconds.

Grade 18

- ☆ Practise taking away from a total of 100 with pounds and pence
- ☆ Practise multiplication and division facts from times tables (up to 12)
- ☆ Multiply by 15 and 20
- ☆ Divide by 6, 15 and 20
- ☆ Convert m to km, m to cm, mm to m, cm to mm and g to kg
- ☆ Give the value of underlined decimal digits
- ☆ Give multiples of 5, 12 and 15 and proper factors of 8, 12, 27, 28, 40 and 50
- ☆ Find a fraction/percentage of a whole number
- ☆ Name a polygon and a triangle
- ☆ Name an acute/obtuse angle, a right angle, a reflex angle and a 180° angle
- ☆ Name doubles
- ☆ Find a time earlier/later than a given time and convert the 12-hour to the 24-hour clock
- ☆ Convert fractions to decimals
- ☆ Give prime numbers up to 20
- ☆ Find equivalent fractions
- ☆ Place a decimal fraction on a number line
- ☆ Chant times tables
 - * * * * *
- ☆ Calculate products of tenths and hundredths using the 'logic of the language'
- ☆ Recognise, name and define polygons
- ☆ Calculate durations for times specified as a.m. /p.m. times and 24-hour clock times
- ☆ Evaluate expressions using brackets correctly
- ☆ Calculate equivalences using years, months, days, hours, minutes
- ☆ Use the 'logic of the language' to multiply and divide numbers with up to three decimal places
- ☆ Use circles as the basis for sketching triangles and quadrilaterals
- ☆ Calculate durations from information in a grid about playing times for tracks on a CD
- ☆ Complete the questions on the 'I can' pages in Progress Book 5C
- ☆ Discuss achievements in Progress Book 5C and fill in the chart

Resources

Maths Makes Sense Toolkit

- ☆ Percentage disc

Other

- ☆ Lined, plain and $\frac{1}{2}$ cm-squared exercise books, calculators, flipchart, 15-cm rulers, compasses, $\frac{1}{2}$ cm-squared graph paper, glue or sticky tape, board compasses

Cross-curricular links

Outdoor play/physical education

- ☆ Daily practice: record time at beginning and end of activity and say how many minutes have passed between two times

PSHCE

- ☆ Play 'getting to know you' games with designated partners, practising active listening and turn-taking skills

Key vocabulary

power of 10 • equilateral • isosceles • right-angled • scalene • prime factors