ACCESS MATHEMATICS TESTS
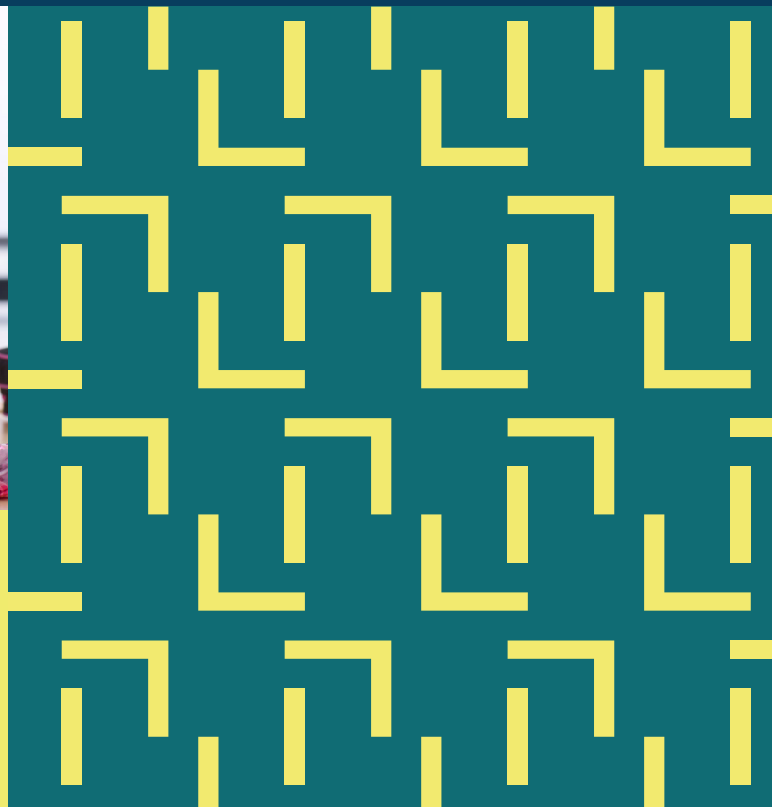
Access Mathematics Tests (AMT)

Your guide to using these standardised tests for learners ages 10 to 16.

Includes:
• Sample pages
• Sample reports
• Assessment Consultant contact details

hachette
LEARNING

ACCESS MATHEMATICS TESTS

About AMT

⏱ **45 minutes (+10 minutes of added time for qualifying learners)**

🖥 **AMT is available in print and in online, interactive and auto-marked formats**

A standardised* assessment with parallel forms that can be taken at the beginning and end of periods of intervention. They empower you to accurately benchmark performance and track progress against peers in their age group. You also get the opportunity to use targeted interventions throughout the year.

- **Confidently assess each learner at any stage in the school year:** You get an accurate picture of their mathematical strengths and areas of improvement, and how they compare against their peers in and outside the school.

- **Save time with targeted interventions:** Your results inform Shine Interventions to give you tailored learning sequences and plans for individual learners; you no longer need to spend time designing interventions.

- **Maximise your department's budget:** AMT doesn't require an external marking service – students can take the tests online and they'll be auto-marked, or teachers can choose print papers, mark the tests themselves and bulk upload into our free reporting software, Boost Insights. Saving you time and money.

- **Create more impactful lesson plans:** if the results show that a group is performing below the representative sample's average in a particular strand, you can make informed, data-driven decisions to spend more lessons focusing on your group's identified area of improvement.

- **Works with your curriculum:** AMT works alongside all major reading curricula, meaning that whatever you teach, wherever you teach it, your can use the assessments to identify a learner's strengths and areas of improvement.

AMT key information

Age range covered: 10 to 16 years

Number of tests: 3 sets of parallel forms (6 papers in total)

Ideal testing time: The assessment can be used at the beginning and end of a period of interventions.

Content assessed: AMT works alongside all major curricula and focuses on mathematical ability and comprehension.

Assessing ability and progress

AMT enables schools to build a comprehensive profile of each learner's ability and progress in mathematics. This includes:

Standardised Score – see if a learner is above or below the average for their peers.

Age-standardised Score – see how a learner is performing compared with learners of the same age, calculated in years and months.

Mathematical age – measure ability against the age at which the learner's performance is typical.

Facility value for every question – see the percentage of learners who answered each question correctly during the standardisation process.

*Standardised against a representative sample of more than 15,000 test submissions in the 2023/24 academic year.

How to use AMT

AMT is designed to bookend a period of intervention e.g. the start and end of the year, the start and end of a term or to test progress as many times as you require.

Here are three potential use cases:

Use Case 1

- Use at the start and end of a school year over three years of education (test at ages 11/12, 12/13 and 13/14)
- AMT can also be used to assess ages 10 to 16.
- Clear marking guidance is provided in the free online mark scheme.
- Administer the tests digitally or enter marks into Boost Insights to automatically generate reports and inform Shine Interventions.
- Use the targeted interventions and learning sequences available to you in Shine Interventions throughout the year.

Use Case 2

- AMT is incredibly flexible within a SEN context. The SENCO determines the best test paper for the learner by looking at the content of each paper.
- A previous school suggests a new learner or group of learners may need additional support in reading.
- A new learner or group of learners joins and their previous school shares no information about them
- A new learner joins part-way through a school year and teachers need a quick picture of their current levels.
- A full cohort test (e.g. CAT4) suggesting a learning or group of learners may need additional support to fill learning gaps

For all of the above, a follow-up test after a period of intervention can be used to show progress

Use Case 3

- You can use AMT when a new cohort or individual learner joins your school to successfully place them in the right class.
- A learner or group of learners transfers from another school, and you need to know what their current level of knowledge is, so that you can accurately place them at the right level of learning.
- A new learner or group of learners joins and their previous school shares no information about them
- A new learner joins part-way through a school year and teachers need a quick picture of their current levels.
- A full cohort test (e.g. CAT4) suggesting a learning or group of learners may need additional support to fill learning gaps

For all of the above, a follow-up test after a period of intervention can be used to show progress

Content suitable for the learner's age

Each form covers material relevant to what a learner is expected to know or be taught by their age, and each form works alongside all major curricula. The new edition has been fully revised.

The content in Form 1A (the first test) covers skills suitable for 10- 12- year-olds to ensure your school gets an accurate understanding of a learner's ability as they start a new phase of education.

Parallel forms

A and B forms are parallel in content and questions asked to ensure you get a clear understanding of how a learner has progressed through the year and the impact of your interventions. Demand increases as the form number climbs e.g. Form 2A is more demanding than Forms 1A and 1B.
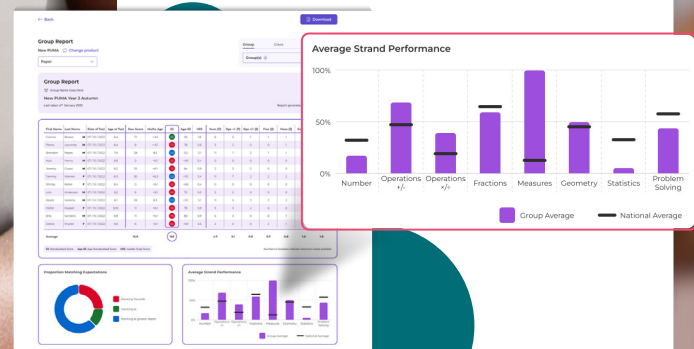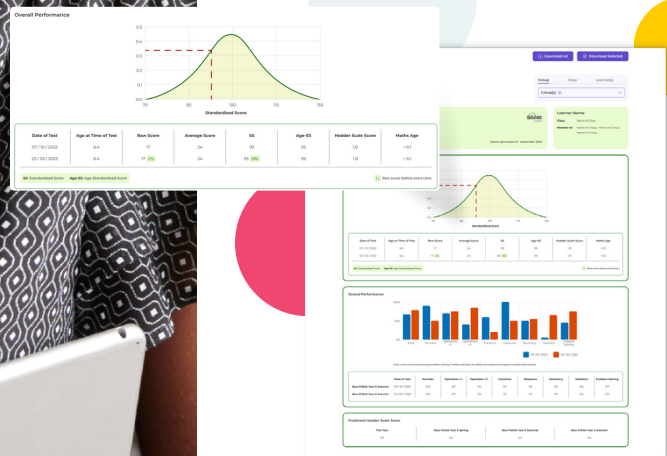
Online and interactive

There are two ways to administer AMT: on paper or online. The online version is interactive and auto-marked, meaning that when a learner finishes the test, you get their results and standardised data straight away.

Boost Insights

HODDER Education
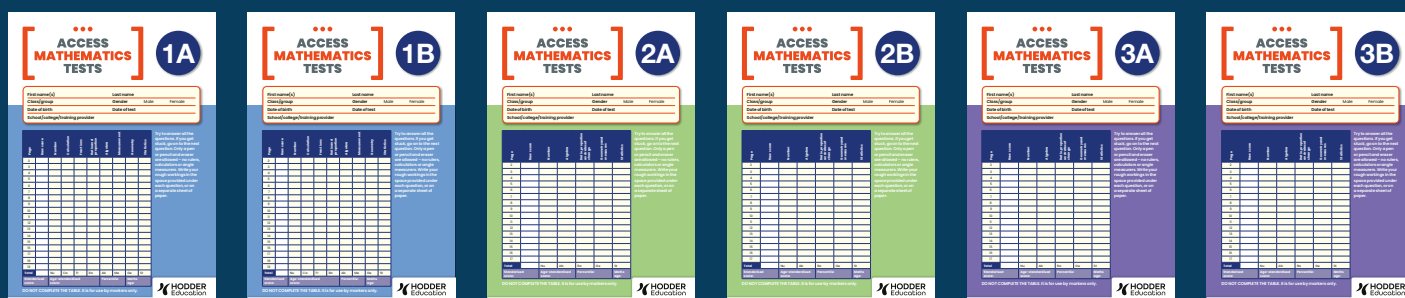
Transforming assessment. Transforming teaching.

Get clear insight into your learners' needs.

New AMT comes with free access to our brand-new online assessment and reporting tool, Boost Insights.

- Quickly analyse results and gaps in learning to inform targeted teaching.

- Bulk upload results from paper tests.

- Effortlessly generate reports for individuals and groups to view and compare learner progress.

- Easily download visual reports that can be shared as PDFs with teachers, senior leaders, MAT leaders, school board members, and parents.

How were the tests developed?

Our standardised tests go through the rigorous stages outlined below to ensure that the content and outcomes are valid.

Initial test construction
Stage 1

- Test development including mathematical review, item-writing, and collation by mathematical experts.

- Construction of assessment maps by mathematical experts with experience teaching and writing standardised tests.

Trialling
Stage 2

- Recruitment of a pool of trial schools who agree to administer the draft tests on learners at their school or schools.

- Careful selection of trials schools to ensure a truly representative sample based on three key criteria: geographical representation, disadvantage and performance. We ensure that our trialling sample is representative of the average student.

- Trailing of the initial tests takes place with more than 15,000 learners at the time the tests are designed to be taken. Some of the same learners then take the follow up tests.

Post-trial review
Stage 3

- Review of performance against every question. The test construction is reviewed and, where necessary, items are reviewed in line with feedback from triallists.

- Expert statisticians review all the test data. This enables standardised scores, age-standardised scores and reading ages to be created, alongside facility values (allowing you to see how learners performed on each question on average).

Publication of test papers and test guidance for use in schools
Stage 4

- Final papers containing tried-and-tested questions are published in print and online.

- Free online test guidance is published alongside the test papers: this contains all data from the trials and guidance on how schools and teachers should administer the tests and interpret the results.

- If using a paper test, mark schemes are available online, enabling teachers to input their own learners' marks and generate specific attainment and progress reports for their classes and individual pupils.

- If using the online, interactive version, the tests are auto-marked. The results feed directly into Boost Insights.

Sample pages Form 1

54 The marks on this jug divide 1 litre into four equal parts.

The jug contains some water.

1 litre ——

Which is the **best estimate** of the volume of water?

Circle your answer.

A 100 ml   **B** 200 ml   **C** 300 ml   **D** 400 ml

55 Here is a calculation.
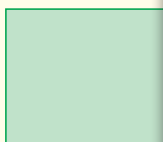
$$X + X + Y$$

X represents a positive whole number.

Y represents a different positive whole number.

Circle **all** the possible values of **Y**.

2   3   4

56 How many lines of symmetry does this shape have?

57 Femi and Maya share 12 sweets.

Femi gets **4 more** sweets than Maya.

How many sweets does Femi get?

sweets

58 George wants to work out 1797 + 401

Which of these calculations will give the correct answer?

Circle your answer.

A 1800 + 400 + 2   **C** 1800 + 400 + 4

B 1800 + 400 − 2   **D** 1800 + 400 − 4

59

x 40°
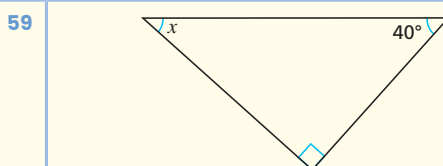
Not drawn to scale

What is the size of angle x?

°

60 Write the number that equals:

7 thousands + 24 hundreds + 1 ten + 2 ones

Sample pages Form 2

19 Kasun measured the height of a plant every week for 9 weeks.
The graph shows the results.
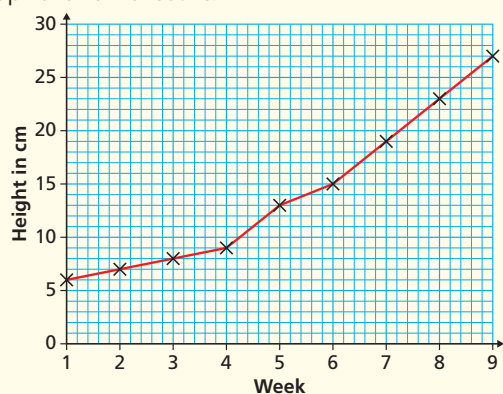
The plant was taller in week 7 than in week 2
How much taller was it?

20 Work out:

1380 ÷

Nu | Ab

21 A shape is drawn on a square grid.

What is the **area** of the shape?

squares

Ge

22 Circle the answer to:

$$\frac{1}{4} + \frac{2}{7}$$

A $\frac{3}{11}$ **B** $\frac{3}{28}$ **C** $\frac{9}{14}$ **D** $\frac{15}{28}$

Nu

23 Circle **all** the prime numbers in this list.

3   5   14   15   17

Nu

Nu | Ab | Ra | Ge | St | **Total:**

Sample pages Form 3

35

7 cm
2 cm
3 cm
11 cm

Not drawn to scale
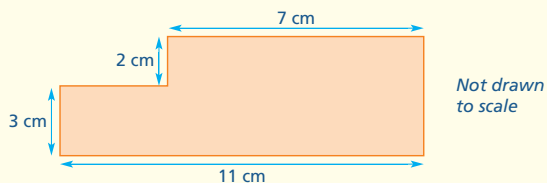
What is the **area** of this shape?

cm² | Ge

36 Amal has 400 millilitres of juice in ...
in a jug.
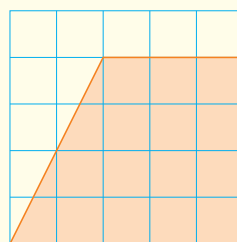What is the **total** volume of juice i...

37 Round 4.96 to **1** decimal place.

Nu | Ab

38 Charlie wants to work out 104 × 23

Which of these calculations will give the correct answer?

Circle your answer.

A 100 + 4 × 23   **C** 4 × 23 + 23 × 100

B 100 × 23 + 4   **D** 100 × 23 − 4 × 23

Nu

39 The triangle on the left is reflected in the mirror line to make the triangle on the right of the mirror line.

y

Mirror line

(−3, 3)

x

(−6, −3)

(−2, −5)

P
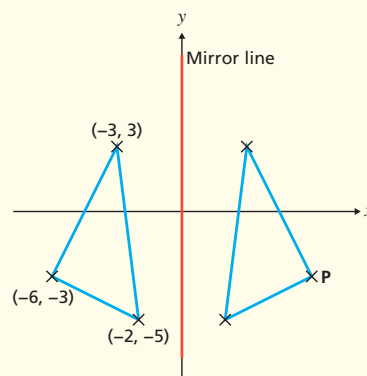
What are the coordinates of the point labelled **P**?

(,   ) | Ge

40 A baby walrus has a mass of 50 kg.
A few weeks later, its mass is 70 kg.
What is the **percentage** increase in the mass of the walrus?

% | Ra

Nu | Ab | Ra | Ge | St | **Total:**

Shine Interventions

Shine AMT

Access targeted interventions for learners taking AMT

Shine Interventions is an online learning resource that uses data to provide targeted interventions and individualised learning experiences for learners.

Powered by your AMT results and the data collected in Boost Insights, our enhanced reporting platform, Shine Interventions presents you with learning sequences and teaching resources designed for an individual learner or group's needs.

- Reduce workload – the high-quality interventions can give you the right tools to provide the right support within a few clicks. You don't need to worry about designing new learning sequences or lesson plans. Our education experts have put together a package of specific and detailed interventions that you can follow.

- Increase staff confidence – the detailed teaching notes and overviews for each learning sequence help teachers and TAs deliver the interventions with confidence. Your team members can learn how to use Shine Interventions swiftly and feel empowered to help learners who need interventions.

- Help learners where they need it – the interventions will fill the learning gaps identified by AMT. You can supply the learner with targeted support and deliver the right learning experience. Best of all, you can watch them progress throughout the year.
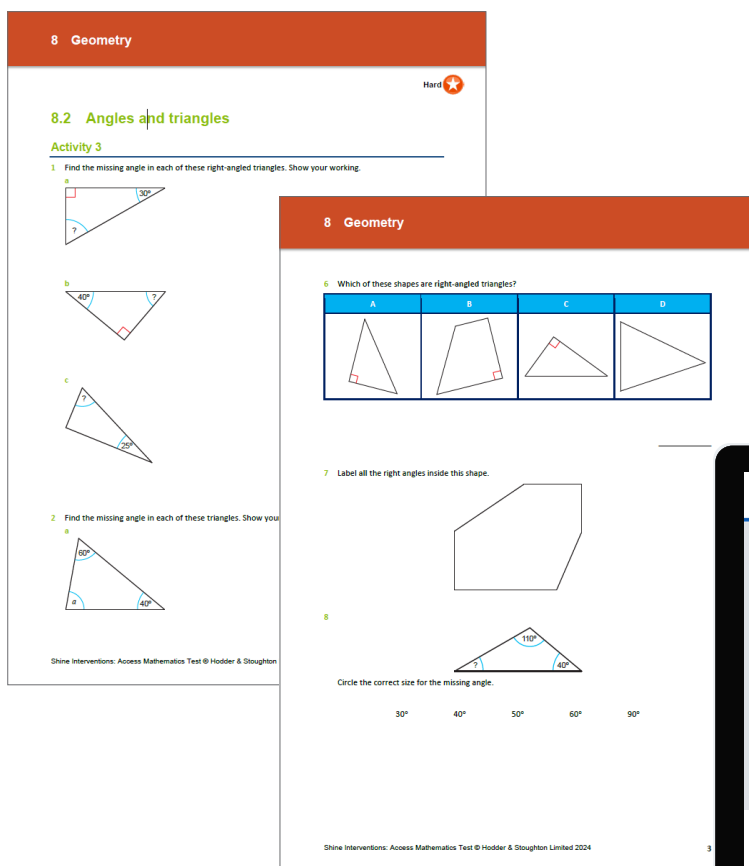
ASSESS.
IDENTIFY.
INTERVENE.

£410
+VAT
per year*
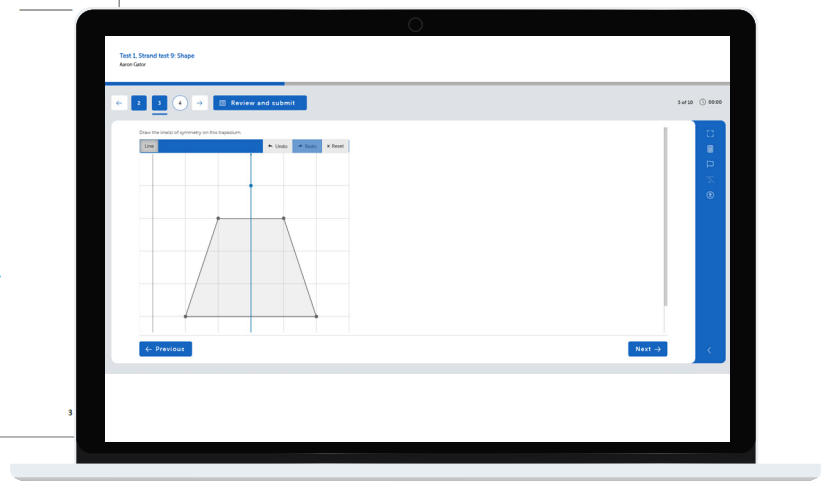
Test Maps
Access Mathematics Tests

Test Maps outline the content covered in every test that is part
of the Access Mathematics Test assessment.

AMT 1 Test Map		
Strand Assessed	**Year**	**Curriculum reference code and statement**
Number and place value	4	4N6 Identify, represent and estimate numbers using different representations.
		4N7 Round any number to the nearest 10, 100 or 1000.
		4N8 Solve number and practical problems that involve all of the above and with increasingly large positive numbers.
	5	5N1 Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.
		5N2 Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.
	6	6N3 Use negative numbers in context, and calculate intervals across zero.
Calculation (addition, subtraction, multiplication and division)	3	3AS4 Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
		3MD2 Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.
		3MD3 Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
	4	4AS1 Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate.
		4MD4 Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
		4MD5 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.
	5	5AS2 Add and subtract numbers mentally with increasingly large numbers.
		5MD1 Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers.
		5MD5 Multiply and divide numbers mentally drawing upon known facts.
		5MD6 Divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.
		5MD7 Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
		5MD8 Recognise and use square numbers and cube numbers, and the notation for squared and cubed.

Fractions (including decimals and percentages)	3	3F2	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
	4	4F2	Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10.
	5	5F1	Compare and order fractions whose denominators are all multiples of the same number.
		5F3	Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements greater than 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$].
		5F4	Add and subtract fractions with the same denominator and denominators that are multiples of the same number.
		5F6	Read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$].
		5F8	Round decimals with two decimal places to the nearest whole number and to one decimal place.
		5F9	Read, write, order and compare numbers with up to three decimal places.
		5F11	Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100 and as a decimal.
	6	6F1	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
		6F8	Multiply one-digit numbers with up to two decimal places by whole numbers.
Ratio and proportion	6	6R1	Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
		6R2	Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.
		6R3	Solve problems involving similar shapes where the scale factor is known or can be found.
		6R4	Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
Algebra	6	6A1	Use simple formulae.
		6A3	Express missing number problems algebraically.
		6A4	Find pairs of numbers that satisfy an equation with two unknowns.
		6A5	Enumerate possibilities of combinations of two variables.
Measurement	3	3M1	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).
	4	4M1	Convert between different units of measure [for example, kilometre to metre; hour to minute].
		4M3	Find the area of rectilinear shapes by counting squares.
		4M6	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.
	5	5M4	Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes.
		5M5	Estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water].
	6	6M4	Recognise that shapes with the same areas can have different perimeters and vice versa.

Geometry – properties of shapes	4	4G2	Identify acute and obtuse angles and compare and order angles up to two right angles by size.
		4G3	Identify lines of symmetry in 2D shapes presented in different orientations.
	6	6G3	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.
Geometry – position and direction	4	4P1	Describe positions on a 2D grid as coordinates in the first quadrant.
		4P3	Plot specified points and draw sides to complete a given polygon.
	5	5P1	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.
	6	6P1	Describe positions on the full coordinate grid (all four quadrants).
		6P2	Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Statistics	4	4S2	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
	5	5S1	Solve comparison, sum and difference problems using information presented in a line graph.
		5S2	Complete, read and interpret information in tables, including timetables.

Ready-to-progress criteria map		
Strand Assessed	**Year**	**Ready-to-progress criterion reference code and statement**
Number and place value	4	**4NPV-2** Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.
		4NPV-3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1000 and 100, and rounding to the nearest of each.
		4NPV-4 Divide 1000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1000 with 2, 4, 5 and 10 equal parts.
	5	**5NPV-1** Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.
		5NPV-2 Recognise the place value of each digit in numbers with up to two decimal places, and compose and decompose numbers with up to two decimal places using standard and non-standard partitioning.
		5NPV-3 Reason about the location of any number with up to two decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.
		5NPV-4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.
		5NPV-5 Convert between units of measure, including using common decimals and fractions.
	6	**6NPV-1** Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1000).
		6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.
		6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.
		6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
Number facts	4	**4NF-1** Recall multiplication and division facts up to 12 × 12, and recognise products in multiplication tables as multiples of the corresponding number.
		4NF-2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.
	5	**5NF-1** Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.
		5NF-2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).

Addition and subtraction, multiplication and division	4	4MD-1	Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.
		4MD-3	Understand and apply the distributive property of multiplication.
	5	5MD-1	Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.
		5MD-2	Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of two or three factors.
		5MD-3	Multiply any whole number with up to four digits by any one-digit number using a formal written method.
		5MD-4	Divide a number with up to four digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.
	6	6AS/MD-1	Understand that two numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
		6AS/MD-2	Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships and place-value understanding.
		6AS/MD-3	Solve problems involving ratio relationships.
		6AS/MD-4	Solve problems with two unknowns.
Fractions	4	4F-2	Convert mixed numbers to improper fractions and vice versa.
	5	5F-1	Find non-unit fractions of quantities.
		5F-2	Find equivalent fractions and understand that they have the same value and the same position in the linear number system.
	6	6F-1	Recognise when fractions can be simplified, and use common factors to simplify fractions.
		6F-2	Express fractions in a common denomination and use this to compare fractions that are similar in value.
		6F-3	Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.
Geometry	4	4G-1	Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.
		4G-2	Identify regular polygons, including equilateral triangles and squares, as those in which side lengths and angles are equal; find perimeter of regular and irregular polygons.
		4G-3	Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.
	5	5G-1	Compare angles, estimate and measure angles in degrees, and draw angles of a given size.
		5G-2	Compare areas and calculate the area of rectangles (including squares) using standard units.
	6	6G-1	Draw, compose and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

AMT 1 Test Map		
Strand	**Curriculum reference code**	**Statement**
Number	N1	Understand and use place value for decimals, measures and integers of any size.
	N2	Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=, \neq, <, >, \leq, \geq$.
	N3	Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property.
	N4	Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
	N5	Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals.
	N6	Recognise and use relationships between operations including inverse operations.
	N7	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations.
	N9	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$).
	N11	Interpret fractions and percentages as operators.
	N12	Use standard units of mass, length, time, money and other measures, including with decimal quantities.
	N13	Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures].
	N14	Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$.

Algebra	A1	Use and interpret algebraic notation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$; $\frac{a}{b}$ in place of $a \div b$; coefficients written as fractions rather than as decimals; brackets.
	A2	Substitute numerical values into formulae and expressions, including scientific formulae.
	A3	Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
	A4	Simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms; multiplying a single term over a bracket; taking out common factors; expanding products of two or more binomials.
	A5	Understand and use standard mathematical formulae; rearrange formulae to change the subject.
	A6	Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
	A8	Work with coordinates in all four quadrants.
	A14	Generate terms of a sequence from either a term-to-term or a position-to-term rule.
Ratio, proportion and rates of change	R1	Change freely between related standard units [for example time, length, area, volume/capacity, mass].
	R3	Express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1.
	R8	Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics.
	R9	Solve problems involving direct and inverse proportion, including graphical and algebraic representations.
Geometry and measures	G2	Calculate and solve problems involving: perimeters of 2D shapes (including circles), areas of circles and composite shapes.
	G3	Draw and measure line segments and angles in geometric figures, including interpreting scale drawings.
	G5	Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric.
	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
	G10	Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.
	G12	Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.
	G16	Interpret mathematical relationships both algebraically and geometrically.
Statistics	S2	Construct and interpret appropriate tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.

AMT 3 Test Map		
Strand	**Curriculum reference code**	**Statement**
Number	N2	Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=, \neq, <, >, \leq, \geq$.
	N3	Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property.
	N4	Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
	N5	Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals.
	N7	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations.
	N9	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$).
	N10	Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%.
	N12	Use standard units of mass, length, time, money and other measures, including with decimal quantities.
	N13	Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures].
Algebra	A1	Use and interpret algebraic notation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$; $\frac{a}{b}$ in place of $a \div b$; coefficients written as fractions rather than as decimals; brackets.
	A2	Substitute numerical values into formulae and expressions, including scientific formulae.
	A3	Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
	A4	Simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms; multiplying a single term over a bracket; taking out common factors; expanding products of two or more binomials.
	A5	Understand and use standard mathematical formulae; rearrange formulae to change the subject.
	A6	Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
	A7	Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement).
	A9	Recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane.

	A11	Reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically.	
	A12	Use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations.	
Ratio, proportion and rates of change	R1	Change freely between related standard units [for example time, length, area, volume/capacity, mass].	
	R3	Express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1.	
	R4	Use ratio notation, including reduction to simplest form	
	R5	Divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio.	
	R6	Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction.	
	R7	Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions.	
	R8	Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics.	
	R9	Solve problems involving direct and inverse proportion, including graphical and algebraic representations.	
	R10	Use compound units such as speed, unit pricing and density to solve problems.	
Geometry and measures	G1	Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders).	
	G2	Calculate and solve problems involving: perimeters of 2D shapes (including circles), areas of circles and composite shapes.	
	G5	Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric.	
	G8	Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.	
	G10	Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.	
	G11	Understand and use the relationship between parallel lines and alternate and corresponding angles.	
	G13	Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs.	
Statistics	S1	Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers).	
	S2	Construct and interpret appropriate tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data.	

Contact us

📞 **Tel:** 01235 400555

🇬🇧 **UK email:** education@hachette.co.uk

🌍 **International email:** international.sales@hodder.co.uk

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