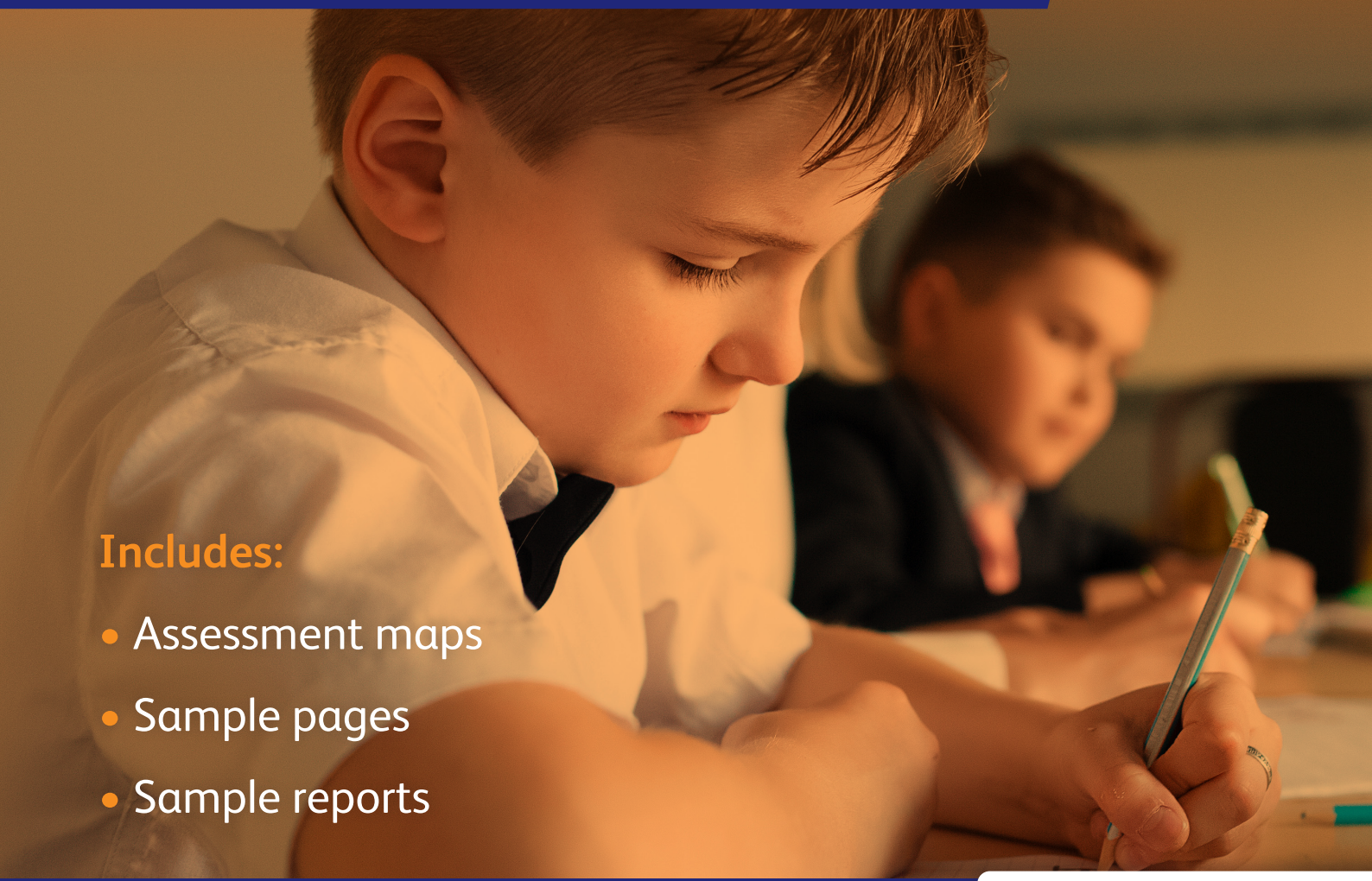
puma
for Scotland

Progress in Undestanding Mathematics Assessment (PUMA)

Your guide to using these termly tests for Primary 1 to 7



Includes:

- Assessment maps
- Sample pages
- Sample reports

hoddergibson.co.uk/pumaforscotland 01235 400555

HODDER Education

puma for Scotland

Contents

About PUMA for Scotland

Termly tests that empower you to reliably benchmark performance and track progress against standardisation averages in mathematics. Standardised on over 10,000 pupils in 2019/20/21.

- Confidently assess each benchmark for Numeracy and Mathematics and identify strengths and weaknesses to inform teacher planning.
- Papers are quick and simple to administer and mark, or save even more time with the online, auto-marked, interactive versions, carefully written to ensure a steady progression in demand.
- Written by established authors who have years of teaching and test-writing experience and who are passionate about providing high-quality, diagnostic information to assist teachers and support children's learning.
- **FREE** online gap analysis and reports available in MARK, our online assessment and reporting tool.
- Access 'next step' intervention activities to directly address knowledge gaps identified in assessments.

PUMA for Scotland key information

Age range covered: 4 to 11 years.

Number of assessments: 1 assessment per term for each year group from Primary 2 to 7 (Autumn, Spring and Summer) and for Primary 1 in Summer only.

Ideal testing time: Towards the end of each term.

Content assessed: Tailored to work alongside the Scottish Curriculum for Excellence and reflect Scottish benchmarks for Numeracy and Mathematics.

Assessment maps: Outline content covered in every assessment.

PUMA for Scotland is also available in online, auto-marked, interactive format.

Assessing attainment and progress

PUMA for Scotland enables schools to build a comprehensive profile of each pupil's attainment and progress in mathematics. These include:

Standardised score

See whether the pupil's attainment is above or below the standardisation average for their year cohort.

Age-standardised score

See how the pupil is performing against other pupils of the same age, calculated in years and months.

Mathematics age

Get a quick measure of attainment against the age at which the pupil's performance is typical.

Strand/topic analysis (including strand standardisation average)

See strengths and weaknesses across the curriculum to inform future teaching.

Facility value for every question

See the percentage of pupils who answered each question correctly in the standardisation trial.

Hodder Scale Score

Measure pupil progress with this independent scale. Useful for tracking progress and estimating future performance of children who are working outside of their age range, but continue to make small increments of progress for their year.

MARK

Using assessments to guide planning, teaching and intervention

PUMA for Scotland comes with free access to MARK, our online assessment and reporting tool designed to save you time.

- Quickly analyse gaps in learning to inform targeted teaching.
- Enter paper test scores into online marksheets or automatically access interactive test results.
- Effortlessly generate reports for individuals, classes, schools and tailored groups to view and compare pupil progress and attainment.
- Easily download visual reports that can be shared as PDFs with teachers, senior leaders, MAT leaders, governors, parents and Ofsted.

Using PUMA for Scotland

- Use with your Primary 1 to 7 pupils towards the end of each term.
- Clear marking guidance is provided in the free online mark scheme.
- Raw scores can be converted to other measures, such as standardised scores, using the free online mark scheme and test guidance. Marks can also be entered into the online marksheets on MARK, enabling you to generate reports automatically.

Assessment maps

The free online assessment maps allow you to check what content is covered in each termly test, so that you can build this into your planning at the beginning of the year and ensure everything has been taught in class before the assessments are administered. They show a breakdown of areas covered in each paper, by curriculum organiser.

The structure of the tests

First level Mathematics

Term	Paper	Total marks available	Price per 10 copy pack	Price per interactive test credit	Recommended test time	
Autumn	Primary 2-3	30	£20.00	£2.00	40 minutes	FREE online mark schemes, test guidance and access to MARK
Spring	Primary 2-3	30	£20.00	£2.00	40 minutes	
Summer	Primary 1-3	Primary 1-2: 30, Primary 3: 35	£20.00	£2.00	Primary 1-2: 40 minutes, Primary 3: 45 minutes	

Second level Mathematics

Term	Paper	Total marks available	Price per 10 copy pack	Price per interactive test credit	Recommended test time	
Autumn	Primary 4-5	45	£20.00	£2.00	55 minutes	FREE online mark schemes, test guidance and access to MARK
	Primary 6-7	55	£20.00	£2.00	60 minutes	
Spring	Primary 4-5	45	£20.00	£2.00	55 minutes	
	Primary 6-7	55	£20.00	£2.00	60 minutes	
Summer	Primary 4-5	45	£20.00	£2.00	55 minutes	
	Primary 6-7	55	£20.00	£2.00	60 minutes	

What do the assessments cover?

Current and previous year content

The curriculum maps (pages 8–10) outline the content covered in every assessment for each year group, and shows whether content is taken from the current year group or assesses previous learning.

Test design and Demand

Every assessment follows a simple design which pupils should be told about. The first questions are on arithmetic – separated into number, multiples and some fractions for finer analysis. Next follows number and fractions in simple contexts, then in reasoning contexts. Then, measurement, shape and data are covered and the assessment ends with the final five marks of harder questions. Generally, the easier questions occur at the beginning of each section. This design of assessment is called a 'saw tooth' because it includes a number of 'restarts' as each new section is met.

Curriculum content

The curriculum is broken down into the CfE curriculum organisers to meet the Benchmarks for Numeracy and Mathematics for First and Second Level. Teachers can use our free online assessment and reporting tool, MARK, to analyse performance in each curriculum organiser and spot both strengths and areas in need of intervention.

First and Second Level

Curriculum organiser reference
Number and number processes / **estimation** and rounding
Multiples, factors and primes
Fractions, decimal fractions and percentages
Money
Time
Measurement
Patterns and relationships / **expressions** and equations
Shape, position and movement
Data and analysis

How were the assessments developed?

Our standardised assessments go through the stages outlined below, to ensure that the content and outcomes are valid and reliable.

Stage 1: Initial assessment construction

- Test development including item-writing and collation by primary experts with teaching and writing experience.
- Construction of assessment maps.

Stage 2: Trialling

- Recruitment of a pool of trial schools who agree to administer the draft assessments on the pupils in their school.
- Careful selection of trial schools to ensure a representative sample, based on 3 key criteria: geographical representation, disadvantage and performance. We ensure that our trialling sample is representative of the average in these areas.
- Trialling of these initial assessments takes place with thousands of pupils at the time the tests will be taken in the second half of each term. The same pupils take all three tests across the year to ensure reliable progress outcomes can be delivered.

Stage 3: Post-trial review

- Review of pupil performance on every single question. The assessment construction is reviewed and, where necessary, items are reviewed in line with feedback from triallists.
- Review of all test data by expert statisticians. This enables standardised scores, age-standardised scores and mathematics ages to be created, alongside facility values (which allow you to see which questions pupils performed well on and which pupils found more challenging during the trialling). The Hodder Scale, our independent decimal scale, allows fine monitoring of progress and estimation of future performance.

Stage 4: Publication of assessment papers and guidance for use in schools

- Final papers containing tried-and-tested questions are published.
- Free online test guidance is published alongside the papers; this contains all data from the trials and guidance on how schools and teachers should administer the assessments and interpret the results.
- Online mark schemes and reports are made available on MARK, enabling teachers to input their own pupils' marks and generate a variety of attainment and progress reports for their classes and individual pupils.

Meet the authors of the assessments

The writers of PUMA for Scotland are test development experts:

❯ Colin McCarty

Colin McCarty was a teacher for 25 years before taking on the role of Project Director of National Curriculum test development for Key Stage 2 and Key Stage 3 from their inception. He has written a wide range of standardised assessments covering reading, writing, SPAG, mathematics and science. He is passionate about providing high quality, diagnostic information that assists teachers and supports children's learning. Colin believes that summative and diagnostic information leads to data richness, which underpins assessment.

❯ Caroline Cooke

Caroline Cooke is a highly experienced teacher who has worked as a Numeracy consultant and Curriculum adviser for mathematics and within a local authority as an advisor. She has also worked with the National Assessment Agency and as a Principal Officer for mathematics for the Qualifications and Curriculum Authority, which involved working closely with the Maths Test Development Team to create KS1-KS3 National Tests. . Caroline works with the STA as a curriculum expert, offering test development advice on both KS1 and KS2. She is a Fellow of the Chartered Institute of Educational Assessors.

Autumn - Assessment map

Curriculum organiser	E&O	P2 Autumn	Marks
Number and number processes	MNU 0-02a	I have explored numbers, understanding that they represent quantities, and I can use them to count, create sequences and describe order.	2
	MNU 0-03a	I use practical materials and can 'count on and back' to help me understand addition and subtraction, recording my ideas and solutions in different ways.	7
	MNU 1-02a	I have investigated how whole numbers are constructed, can understand the importance of zero within the system and can use my knowledge to explain the link between a digit, its place and its value.	1
	MNU 1-03a	I can use addition, subtraction, multiplication and division when solving problems, making best use of the mental strategies and written skills I have developed.	8
Time	MNU 0-10a	I am aware of how routines and events in my world link with times and seasons, and have explored ways to record and display these using clocks, calendars and other methods.	2
Measurement	MNU 0-11a	I have experimented with everyday items as units of measure to investigate and compare sizes and amounts in my environment, sharing my findings with others.	1
Shape, position and movement	MTH 0-16a	I enjoy investigating objects and shapes and can sort, describe and be creative with them.	1
	MTH 0-17a	In movement, games, and using technology I can use simple directions and describe positions.	2
	MTH 1-16a	I have explored simple 3D objects and 2D shapes and can identify, name and describe their features using appropriate vocabulary.	6

Curriculum organiser	E&O	P3 Autumn	Marks
Number and number processes	MNU 1-02a	I have investigated how whole numbers are constructed, can understand the importance of zero within the system and can use my knowledge to explain the link between a digit, its place and its value.	10
	MNU 1-03a	I can use addition, subtraction, multiplication and division when solving problems, making best use of the mental strategies and written skills I have developed.	8
Fractions, decimal fractions and percentages	MNU 1-07a	Having explored fractions by taking part in practical activities, I can show my understanding of: • how a single item can be shared equally; • the notation and vocabulary associated with fractions; and • where simple fractions lie on the number line.	1
	MNU 1-07b	Through exploring how groups of items can be shared equally, I can find a fraction of an amount by applying my knowledge of division.	1
Measurement	MNU 0-11a	I have experimented with everyday items as units of measure to investigate and compare sizes and amounts in my environment, sharing my findings with others.	1
	MNU 1-11a	I can estimate how long or heavy an object is, or what amount it holds, using everyday things as a guide, then measure or weigh it using appropriate instruments and units.	1

To view assessment maps for all years and terms, visit **hoddergibson.co.uk/pumaforscotland**

Patterns and relationships / Expressions and equations	MTH 1-13b	Through exploring number patterns, I can recognise and continue simple number sequences and can explain the rule I have applied.	2
Shape, position and movement	MTH 1-16a	I have explored simple 3D objects and 2D shapes and can identify, name and describe their features using appropriate vocabulary.	2
Data and analysis	MNU 1-20a	I have explored a variety of ways in which data is presented and can ask and answer questions about the information it contains.	4

Curriculum organiser	E&O	P4 Autumn	Marks
Estimation and rounding	MNU 1-01a	I can share ideas with others to develop ways of estimating the answer to a calculation or problem, work out the actual answer, then check my solution by comparing it with the estimate.	1
Number and number processes	MNU 1-02a	I have investigated how whole numbers are constructed, can understand the importance of zero within the system and can use my knowledge to explain the link between a digit, its place and its value.	5
	MNU 1-03a	I can use addition, subtraction, multiplication and division when solving problems, making best use of the mental strategies and written skills I have developed.	20
Fractions, decimal fractions and percentages	MNU 1-07a	Having explored fractions by taking part in practical activities, I can show my understanding of: • how a single item can be shared equally; • the notation and vocabulary associated with fractions; and • where simple fractions lie on the number line.	3
	MNU 1-07b	Through exploring how groups of items can be shared equally, I can find a fraction of an amount by applying my knowledge of division.	1
Money	MNU 1-09a	I can use money to pay for items and can work out how much change I should receive.	4
Measurement	MNU 1-11a	I can estimate how long or heavy an object is, or what amount it holds, using everyday things as a guide, then measure or weigh it using appropriate instruments and units.	2
Patterns and relationships / Expressions and equations	MTH 1-13a	I can continue and devise more involved repeating patterns or designs, using a variety of media.	1
	MTH 1-13b	Through exploring number patterns, I can recognise and continue simple number sequences and can explain the rule I have applied.	1
Shape, position and movement	MTH 0-17a	In movement, games, and using technology I can use simple directions and describe positions.	1
	MTH 1-16a	I have explored simple 3D objects and 2D shapes and can identify, name and describe their features using appropriate vocabulary.	2
	MTH 1-17a	I can describe, follow and record routes and journeys using signs, words and angles associated with direction and turning.	1
Data and analysis	MNU 1-20a	I have explored a variety of ways in which data is presented and can ask and answer questions about the information it contains.	3

5 $13 + \square = 18$

num

6 Double 9 is $\square$

num

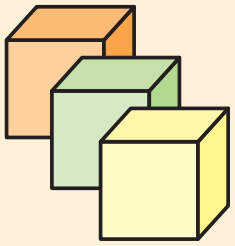
Double $\square$ is 14

num

► Extra space for working out.

page total

9 8 children need 3 cubes each.



How many cubes do they need altogether? _____ cubes

num, PS

10 Mrs Varma has 96 grapes.

She shares the grapes between 4 children. She gives the **same** number of grapes to each child.

How many grapes does each child get? _____ grapes

num, PS

11 Sue plants 8 sunflower seeds.

Only 5 seeds grow.

What **fraction** of her seeds grow? $\frac{\quad}{\quad}$

frac

page total

▶ **All PUMA for Scotland tests are structured to allow a balance of content from all curriculum organisers, drawing on prior year content so papers work alongside Maths Mastery and other popular schemes.**

▶ **Every question is mapped to the CfE curriculum organisers (as well as problem solving), allowing question and topic level reporting.**

1 $6 + 2 + 8 + 4 =$ ☐ num

2 Write the missing numbers.

☐ $+ 76 = 376$

$1{,}000 + 300 + 50 =$ ☐ num

▶ **Each assessment begins with number-based arithmetic questions.**

3 Tick the **three different** numbers that sum to 1,600

200 400 500 600 700

num, PS

4 Write the missing numbers to make each sum **equal** 56

$56 =$ ☐ $+ 6$

$56 =$ ☐ $+ 26$

$56 = 40 +$ ☐ num

page total ☐

37 Jack drove to Europe for a holiday and returned at the end of the week.

The table shows the distance he travelled each day.

	Sat	Sun	Mon	Tues	Wed	Thurs	Fri
Jack	52 miles	391 km	26 km	26 km	26 km	391 km	52 miles

Assume 5 miles = 8 kilometres.

(a) How many **kilometres** did Jack travel on Saturday and Friday **altogether**?

km

meas, PS

(b) How many **kilometres** did Jack travel, **in total**, from Saturday to Friday inclusive?

km

num, PS

38 Write your answer as a decimal in the box.

▶ **Additional marks have been added to certain papers, to increase the challenge for pupils who are working at greater depth. This also allows for differentiation of greater depth pupils.**

$$0.22 + \left(\frac{4}{11} \times \frac{22}{5}\right) =$$

num

page total

puma for Scotland interactive

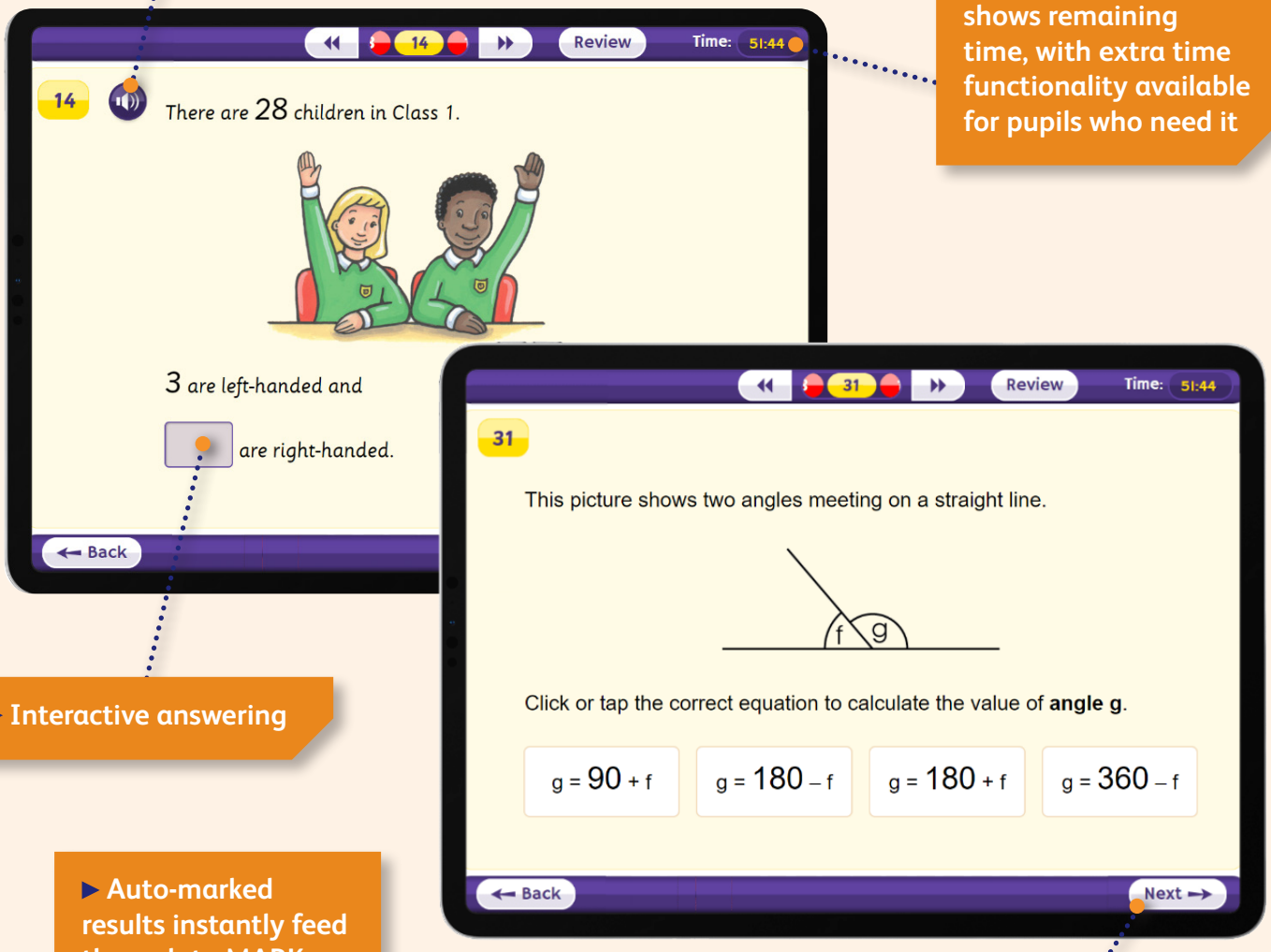
Interactive assessments

PUMA for Scotland is also available in online, auto-marked, interactive format.

Suitable for iPad, laptop or desktop, background and text colours have been designed to be accessible for pupils with sight difficulties. Plus, you could save up to 40 minutes in marking and admin time per 30 tests!*

▶ Supporting audio for KS1

▶ Countdown clock shows remaining time, with extra time functionality available for pupils who need it



▶ Interactive answering

▶ Auto-marked results instantly feed through to MARK

▶ Animated navigation buttons allow pupils to work through assessments

*Estimations calculated based on an average marking time of 90 seconds per test.

Free online assessment and reporting tool with every PUMA for Scotland purchase

MARK (My Assessment and Reporting Kit) is trusted by over 6,000 schools for valid, easy-to-use assessment reporting and used by teachers to analyse over 12 million assessments.

- Quickly analyse gaps in learning to inform targeted teaching.
- Effortlessly generate reports for individuals, classes, schools and tailored groups to view and compare pupil progress and attainment.
- Easily download visual reports that can be shared as PDFs with teachers, senior leaders, MAT leaders, governors, parents and Ofsted.
- Automatically sync the pupil, teacher and school data in your Management Information System with MARK.

What information do the reports provide?

Individual Pupil Report
View the performance of an individual pupil on their most recently taken test

Pupil Progress Report
Compare the performance of one pupil across a number of tests

Group Listing Report
View the performance of one group on a specific test

Group Comparison Report
View the performance of different groups on a specific test

Gap Analysis
Quickly analyse gaps in learning to inform targeted teaching

Over **2 million** registered students

More than **12.5 million** tests marked

Over **6,000** institutions registered

More than **3 million reports** downloaded

Most popular reports generated:

1. **890,000+** individual pupil reports
2. **1,850,000+** academic year, class or group listing reports
3. **440,000+** pupil progress reports

Sample reports

Individual Pupil Progress Reports

▶ **Summary** shows date of last assessment taken and date report was generated

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Pupil Progress Report

Cameron Butler

PUMA for Scotland

Last taken 5th October 2022

MARK

Report generated 19th January 2023

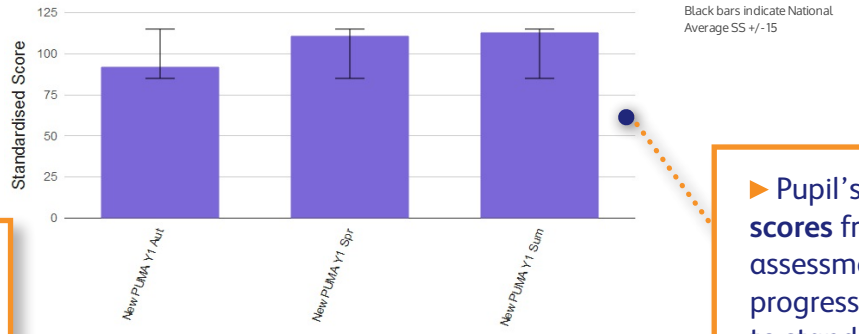
Pupil details

Class: Year 3 class

Member of: Test all pupils; Non-Pupil Premium - Year 3

▶ **Pupil details** provided

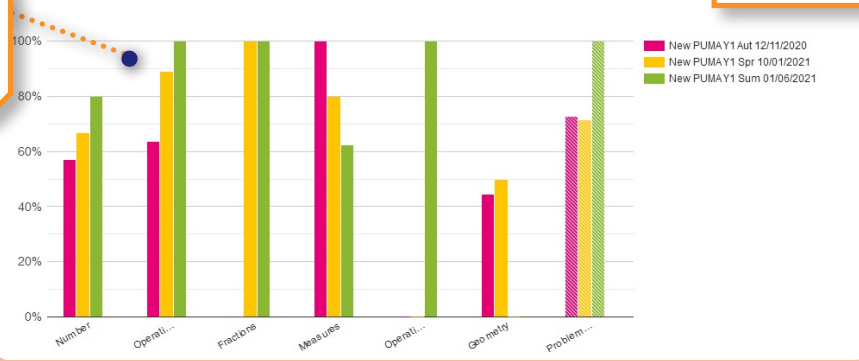
Overall performance



▶ Pupil's **standardised scores** from multiple assessments show progress with reference to standardisation benchmarks

▶ **Past scores** broken down by Strand performance show area progress across multiple assessments

Strand performance



Overall performance

	Test date	Age at time of test	Raw score	National Average SS	SS*	Age-SS †	Hodder Scale Score	Maths Age
New PUMA Y1 Aut	12/11/2020	5:7	18	100	92	92	0.9	<5:1
New PUMA Y1 Spr	10/01/2021	5:9	23	100	111	117	2	6:10
New PUMA Y1 Sum	01/06/2021	6:2	23	100	113	112	2.5	7:1

*SS: Standardised Score † Age-SS: Age-Standardised Score

Strand performance

	Test Date	num	ops +/-	meas	frac	ops ×/÷	geom	PS
New PUMA Y1 Aut	12/11/2020	4/7	7/11	3/3	4/9	8/11		
New PUMA Y1 Spr	10/01/2021	8/12	8/9	4/5	1/2	5/7	2/2	
New PUMA Y1 Sum	01/06/2021	4/5	2/2	5/8	0/3	10/10	8/8	4/4

▶ **Progress** between tests broken down by measurement scales and strand performance

Group Listing Report

▶ Details provided for all pupils within a **selected group**

▶ **Results** listed per pupil with Maths Age, Raw Scores, Standardised Scores and Strand Breakdown displayed

Rising Stars UK Ltd- Correct Rep Account

Academic Year, Class or Group Listing Report

2020 - 2021

New PUMA P2 Autumn

Most recently taken 3rd December 2020

Report generated 19th January 2023

First Name	Last Name	Date of Test	Age at test	Maths Age	Raw Score	SS	Age-SS	HSS	num (7)	ops +/- (11)	meas (3)	geom (9)
Summer	Allen	12/11/2020	5:6	<5:1	5	59	<69	0.2	2	3	0	0
Freya	Baker	02/11/2020	6:9	<5:1	14	82	72	0.7	6	4	2	2
Jatin	Baral	02/11/2020	7:1	6:4	24	108	90	1.7	5	9	2	
Samuel	Bell	02/11/2020	6:4	<5:1	9	69	<69	0.5	2	3	0	
Finley	Butler	02/11/2020	6:8	7:2	27	116	106	2.1	7	11	2	
Poppy	Butler	02/11/2020	6:5	<5:1	13	80	73	0.6	4	3	2	
Cameron	Butler	12/11/2020	5:7	<5:1	18	92	92	0.9	4	7	3	
George	Clark	12/11/2020	6:1	<5:1	12	77	75	0.6	4	6	1	
Samantha	Clarke	02/11/2020	6:7	<5:1	12	77	69	0.6	2	5	0	
Arthur	Davies	12/11/2020	5:10	<5:1	15	85	84	0.7	4	7	0	

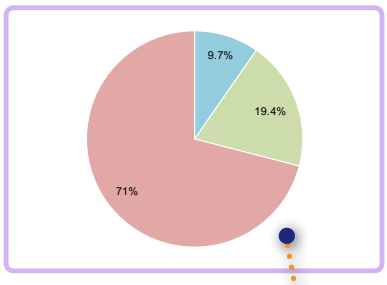
SS: Standardised Score Age-SS: Age-Standardised Score HSS: Hodder Scale Score

Numbers in brackets indicate maximum marks available

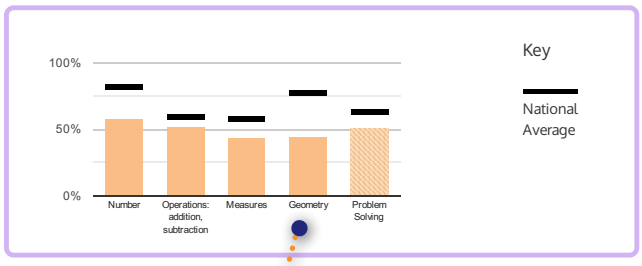
Average	14.4	84.5	4.0	5.7	1.3	3.9

▶ Colour-coded **Standardised Scores** indicate how each pupil is working against expectations

Proportion matching expectations



Average strand performance



▶ A **summary** details which percentage of pupils within the group are currently working at and towards expectations, and those working at a greater depth

▶ **Averages** provide a snapshot of performance for the whole group and compare against standardisation for each strand

View all reports online at risingstars-uk.com/mark

Unlock targeted interventions for PUMA for Scotland with Shine Maths

Diagnostically driven by pupils' PUMA for Scotland assessment results, Shine Intervention Reports generate targeted intervention activities to directly address knowledge gaps identified. Learning Sequences are tailored to each Area of Learning and provide guided activities and worksheets for teachers and teaching assistants, and quick quizzes to measure pupil progress.

▶ Assessment, year group and term provided

▶ This report shows the interventions required for specific pupils within the selected group, year or class, based on the knowledge gaps identified in their assessment results

Rising Stars UK Ltd- Correct Rep Account

Intervention Report – Grouped

Year 1 class

PUMA for Scotland P2 Autumn

Most recently taken 25th January 2023

Report generated 31st January 2023

▶ Broken down by curriculum organiser

This report shows pupils grouped according to their score in each Area of Learning.

Please see the Individual Intervention Report for details specific to each pupil.

▶ Shine Areas of Learning correlate to each curriculum organiser

Strand	Area of Learning	Suggested Learning Sequences	Pupils	Score
Number	Number	Score is above Shine threshold for this Area of Learning.		
Operations: addition, subtraction	Written addition and subtraction	Year 1, Written addition and subtraction 1	Sarah Minty Leon Yate	2/5 2/5
Measures	Measures	Year 1, Measures 1	Charlotte Hiorns	1/3
Geometry	Properties of shape	Year 1, Properties of shape 1	Charlotte Hiorns	3/7
Operations: addition, subtraction	Mental addition and subtraction	Score is above Shine threshold for this Area of Learning.		
Geometry	Position and direction	Year 1, Position and direction	Charlotte Hio Leon Yate	1/2

▶ Each pupil's score in this Area of Learning

▶ Areas of Learning are made up of sub-strands

▶ Links provided to the suggested Learning Sequences

▶ All pupils whose results fall below the Shine threshold indicating intervention is required in this Area of Learning

Arrange a demo with your local RS Assessment Consultant or find out more at risingstars-uk.com/shine