new puma primary

STANDARDISED ASSESSMENTS

New PUMA

(Progress in Understanding Mathematics Assessments)

Ages 4–11

hachettelearning.com/new-puma

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Contents

About New PUMA

These termly, standardised assessments for learners aged 4 to 11 are designed to benchmark performance and track progress against national averages in mathematics.

- Standardised on a nationally representative cohort of more than **7,000 UK learners**.
- Free online **gap analysis and reports** available in Boost Insights, our digital assessment and reporting tool.
- **Curriculum maps** outline content covered in every test to ensure relevant material has been taught before each assessment is administered.
- Free downloadable **mark schemes and test guidance**.

Key Information

Age range covered:
4 to 11 years.

Number of assessments:
One test per term for each year group from Reception Summer to Year 6 Summer.

Ideal testing time:
Second half of each term.

Price:
£21.00 per 10-copy test paper pack.

£2.10 per digital test credit.

Measuring attainment and progress

New PUMA assessments enable schools to build a **comprehensive profile** of each learner's attainment and progress in mathematics by converting their raw scores into a range of other measures.

Easily generate the following metrics with learners' assessment results:

- **Standardised score**
  See whether a learner's attainment is above or below the national average for their year cohort.
- **Maths Age**
  Easily measure the attainment of a learner against the age for which their performance is typical.
- **Hodder Scale Score**
  An independent scale designed to measure progress and estimate future performance of learners working outside of their age range.
- **Age-standardised score**
  See how the learner is performing against other children of the same age, calculated in years and months.
- **Strand/topic analysis**
  (including strand national average)
  Pinpoint strengths and weaknesses across the curriculum to inform future teaching.
- **Facility value**
  See the percentage of learners who answered each specific question correctly in the standardisation trial.
- **Performance indicators**
  Identify whether learners are working at, above or towards the expected standard for their year.

Assessment coverage

New PUMA provides thorough coverage of the National Curriculum 2014 Programme of Study for each year.

Current and previous year content

The assessment maps (pages 22-29) break down the content in each assessment, showing what is taken from the current year group, and which questions tests previous learning.

Autumn tests will usually contain more content from previous year groups than Spring and Summer, to ensure that **demand builds appropriately** and learners are only ever tested on **Content they have been taught**. This enables valid results.

Content Domains

New PUMA uses **Strands** that reflect the National Test content domains for Key Stage 1 and Key Stage 2. Strand analysis in Boost Insights' reporting allow you to easily spot areas of strength and weakness at individual and group levels.

Strands in New PUMA are outlined below. Questions that involve **problem solving** are indicated by the code PS in Mark Schemes.

Strands and Content Domain References

Key Stages 1 & 2	
Strand in New PUMA	**Content Domain**
Number, place value and rounding	**N**
Operations (+/-), addition, subtraction	**C**
Operations (X/÷), multiplication and division, algebra	**C**
Fractions, decimals and percentages, ratio and proportion	**F**
Measures	**M**
Geometry – shape, position, ratio and proportion	**G** & **P**
Statistics and data handling	**S**

Key Stages 2	
Strand in New PUMA	**Content Domain**
Fractions, decimals and percentages, ratio and proportion	**R**
Operations (X/÷), multiplication and division, algebra	**A**

Year 1 papers also test Early Learning Goals (ELG).

Assessment structure

Year Groups	Term	Timings	Marks
Reception	Summer	40 minutes	30
1	Autumn, Spring and Summer	40 minutes	30
2	Autumn and Spring	40 minutes	30
	Summer	45 minutes	35
3 – 4	Autumn, Spring and Summer	55 minutes	45
5 – 6	Autumn Spring and Summer	60 minutes	55

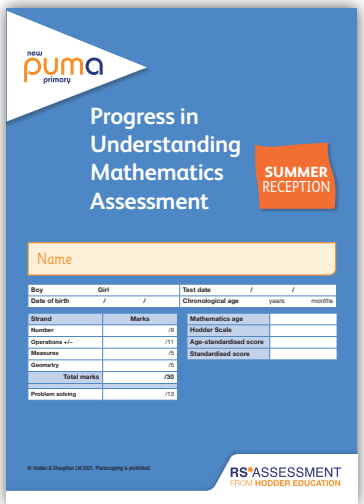
Demand increases both within each test paper and also as the year progresses. Assessments are carefully reviewed to ensure that questions with higher facility values are placed near the beginning of the paper where possible, and those with lower facility values sit towards the end. This means that a **wide ability range is able to access the papers**.

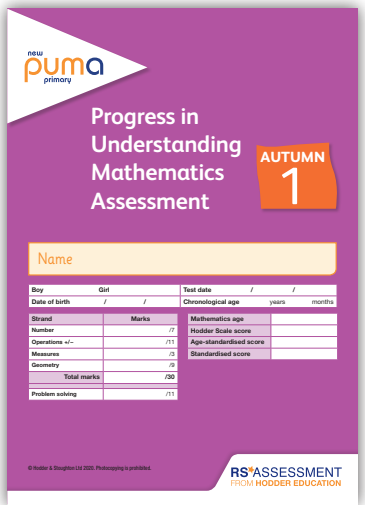
Every test follows a similar structure:

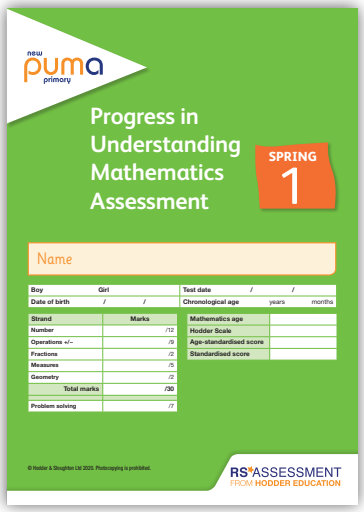
- The first questions are on arithmetic – number, operations and some fractions.
- Next follows number, operations and fractions in simple contexts, then in reasoning contexts.
- Then, measures, geometry and statistics are covered.

Generally, the easier questions occur at the beginning of each strand section. This 'saw tooth' test design provides learners with a number of 'restarts' as each new strand is met, encouraging them to continue through the test even if they find some questions difficult.

From the Year 2 Summer test upwards, there are 5 marks of harder reasoning (**extension**) questions, which provide extra evidence to help teachers discern and differentiate their most able learners. These extension questions also provide a greater opportunity for learners to practise more challenging types of reasoning questions ahead of their National Tests.





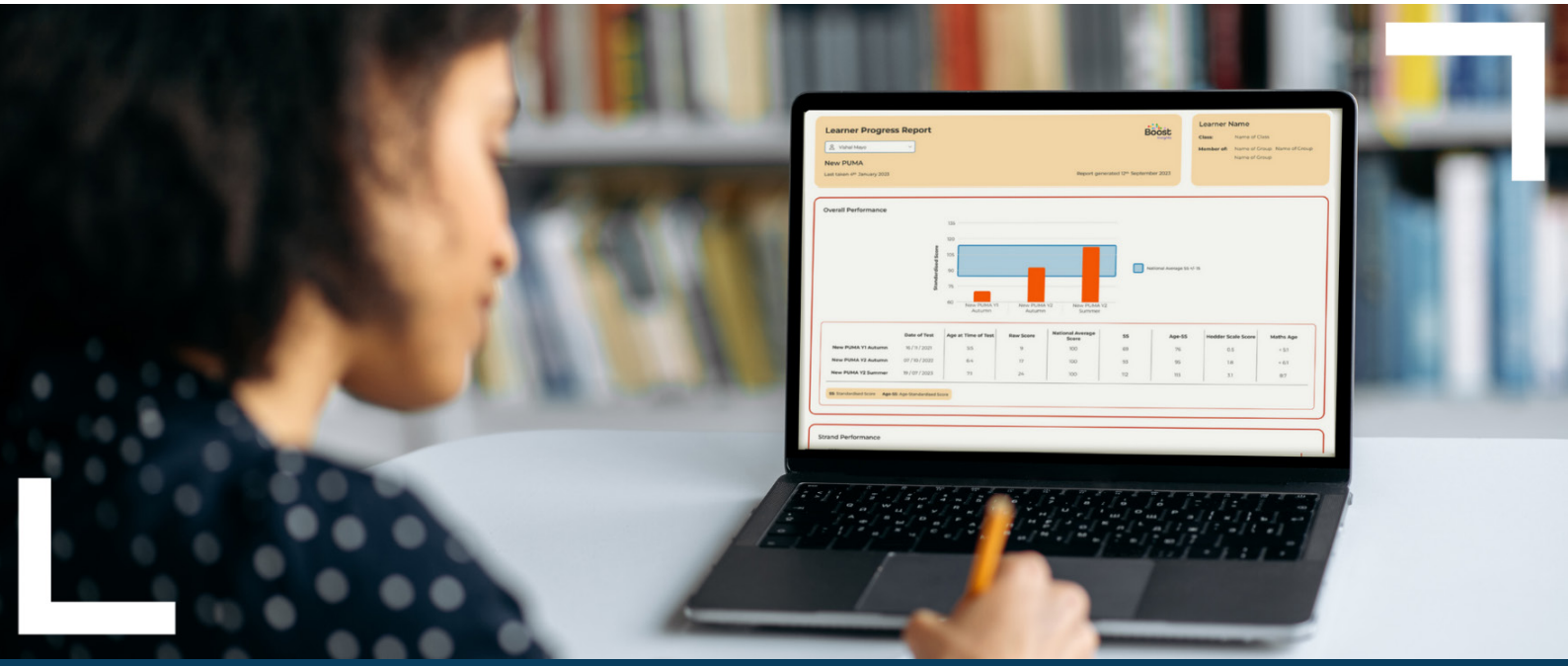


Analysing test data with Boost Insights

Save time and gain actionable insights into your learners' progress and performance data.

With your New PUMA purchase, all staff members in your school gain **free access** to Boost Insights, our assessment data analysis platform:

- Run **instant gap analysis** to identify areas of strength and weakness among groups and individual learners for effective targeted teaching.
- Compare attainment in your school with national (UK) averages.
- Effortlessly **track progress over time** with learner progress reports and compare group performances across multiple tests.
- Download **clear visual reports** to share with teachers, senior leaders, MAT leaders, governors, inspectors and parents.



> "Robust assessments with clear gap analysis and year group/individual data that provides consistency and reliability of data across the school."

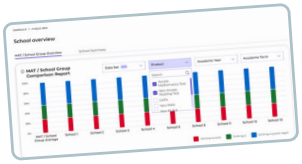
Head Teacher, Lamberhurst St Mary's Church of England Primary School

Instant reporting at your fingertips.

Find the insights you need with reports for individuals, classes, custom groups, schools and MATs in Boost Insights.

School Overview

Compare attainment across year groups throughout your school.

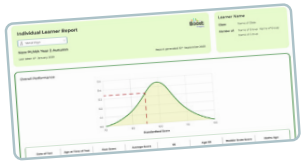


MAT/School Group Comparison

Compare the performance of multiple schools on a specific test suite.

Question-level Analysis

Analyse gaps in learning at a question and strand level.

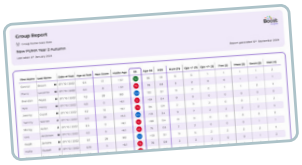


Individual Learner Report

Analyse the performance of a single learner on a specific test.

Learner Progress Report

Compare the performance of one learner across multiple tests.



Group Report

View the overall, average and strand performance of a group on a specific test.

Age Performance Review

Compare the age performance of a group on a specific test.

Test Performance Comparison

Compare the performance of a group on two tests with side-by-side results.

Group Average Review

Compare the average of a group across multiple test suites for an academic year.

Intervention Reports are only available with an active subscription to Shine Interventions. See page 30 for more information.

Individual Intervention Report

Identify knowledge gaps for a single learner and access Learning Sequences.

Grouped Intervention Report

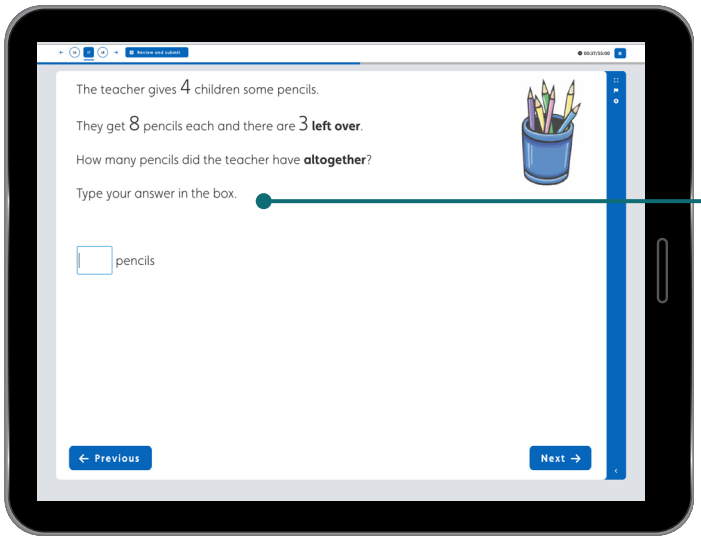
Identify learners with keyknowledge gaps and access Learning Sequences.

Interactive assessments

Skip the marking and cut the admin.

New PUMA is also available in an online, interactive format. Assess all the same content and run the same reports, with no time spent marking!

- Assign tests to individuals, groups or whole classes via Boost Insights.
- Adjustable settings allow you to choose whether or not to display a test timer on learners' screens and allocate **extra time** for those who need it.



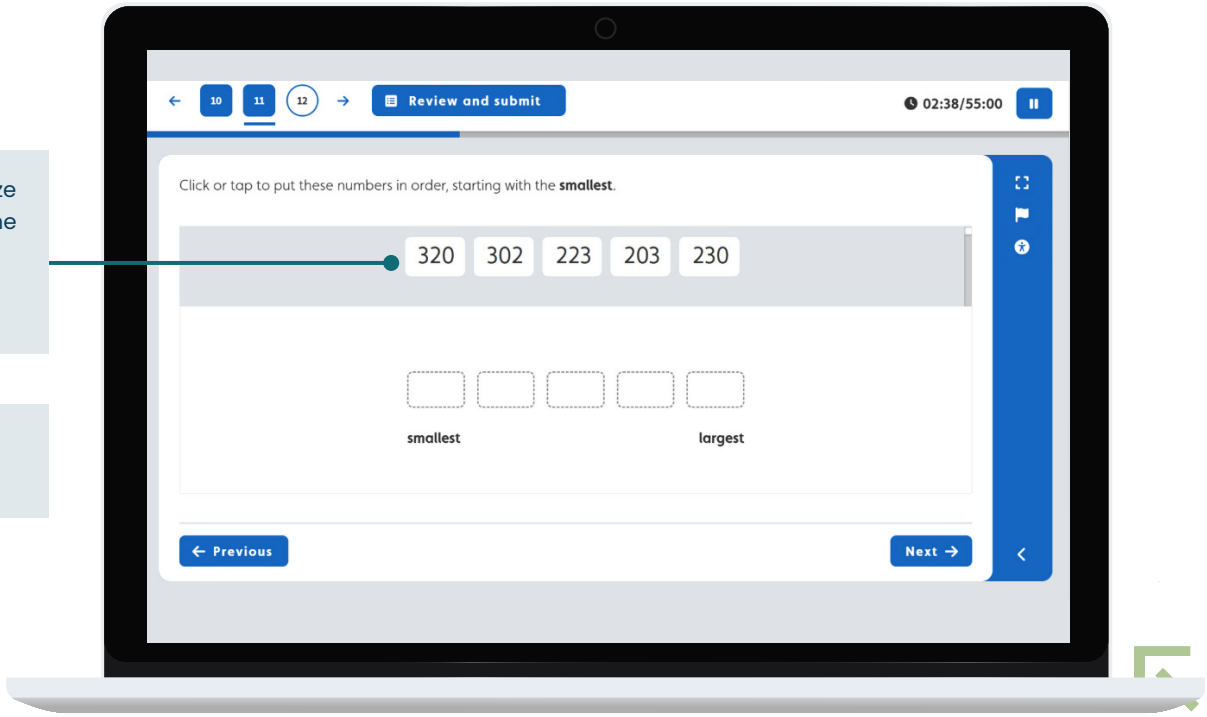
Interactive answering

Review learners' marks and answers once completed

Navigation buttons allow pupils to workthrough assessments

Adjustable font size and colour scheme for learners with sight or reading difficulties

Suitable for iPad, laptop or desktop



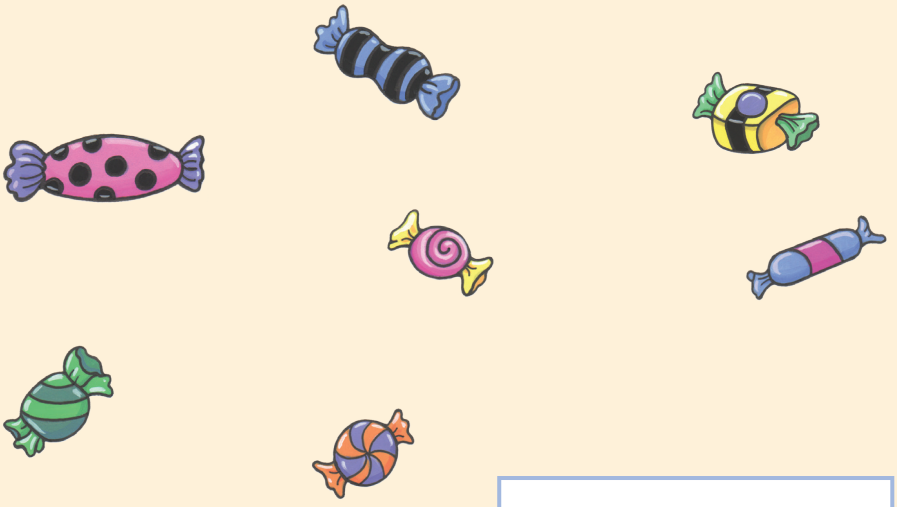
Sample page: Reception Summer

8

fish

ops
+/–

9



sweets

ops
+/–,
PS

page total

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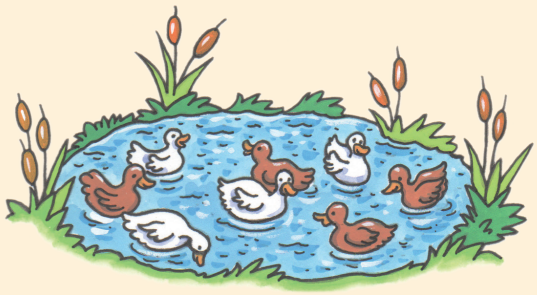
Teacher Scripts accompany tests from Reception to Year 2

No.	Question
8	Billy has **5** fish. Jacob has **3** fish. How many fish do they have **altogether**?
9	Eva has **7** sweets. She eats **4** sweets. How many sweets does she have **left**?
10	Count how many **legs** the spider has. Write your answer on the spider.

Sample page: Year 1 Autumn

7



ducks

ops +/–, PS

8

5 9 4 12 6

num

9

biscuits

ops +/–

page total

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Colourful image-based questions engage young learners

No.	Question
7	There are **8** ducks on the pond. **5** of them fly away. How many ducks are **left**?
8	*(Do not read out the numbers.)* Look at the numbers. Circle **all** the numbers that are **less than 7**.
9	There are **10** biscuits inside the packet and **3 more** biscuits next to it. How many biscuits are there **altogether**?

Sample page: Year 1 Spring

1

19 – 5

17 – 6

9 + 4

7 + 7

ops +/–

ops +/–

2

Half of 10 is ☐

frac

page total

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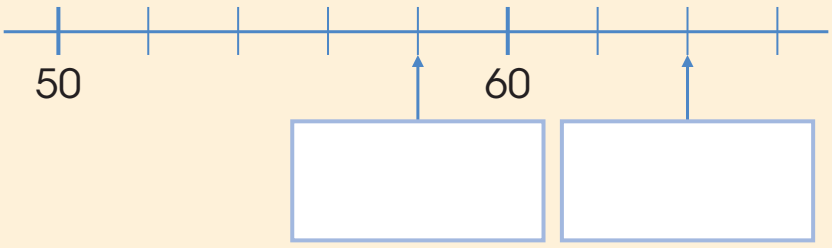
Each assessment begins with number-based arithmetic questions

No.	Question
1	Look at the calculations. **Two** of the calculations are equal to **14**. Circle both of them.
2	What is half of **10**?
3	Look at the number sentence. Write the missing number.
4	Circle the **two** calculations that are equal to **20**.

Sample page: Year 2 Summer

26 (a) Write the missing numbers that the arrows point to.



num

Clear space for answering and working out

(b) What number is exactly **halfway** between the two missing numbers?

num, PS

page total

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Sample page: Year 3 Autumn

12

70 ÷ 10 = ☐ 88 ÷ 8 = ☐

8 × 4 = ☐ 3 × 9 = ☐

ops ×/÷

ops ×/÷

13

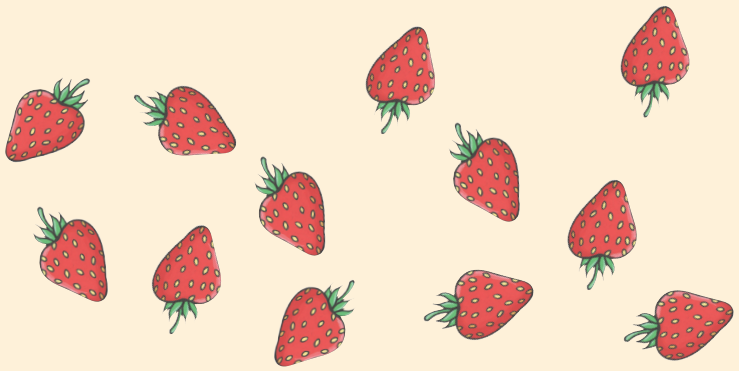
Use all of these digit cards to write a number between 300 and 350

5	3	4

num, PS

14

Jason has 12 strawberries.



He eats 4 of them.
How many are left?

☐ strawberries

ops +/–, PS

page total ☐

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Sample page: Year 3 Spring

8 Use each of the digits **once** to complete the addition.

1 3 5 7

□□ + □□ = 124

ops +/–, PS

9

I'm thinking of a number.
It is greater than 26
It is less than 34
It is a multiple of 5

What number is Puma thinking of? □

num, PS

Plus, keep an eye out for Puma!

10 Circle the numbers where the 4 represents 4 **tens**.

740 704 104 410 46

num

page total □

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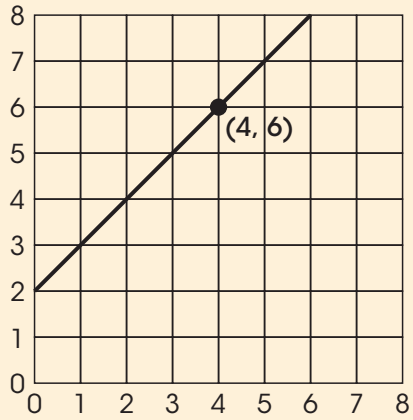
Sample page: Year 4 Summer

26 (4, 6) are coordinates of a point on the line.



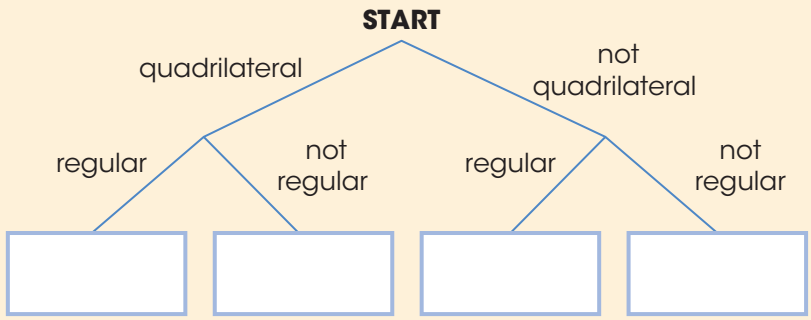
Two of the coordinates below are other points on the same line.

Tick them.

(4, 5) (6, 4) (3, 5) (2, 4) (4, 2)

geom, PS

27 Write the letter of each shape in the correct place on the sorting diagram.
One box has more than one letter.



geom, PS

geom, PS

page total

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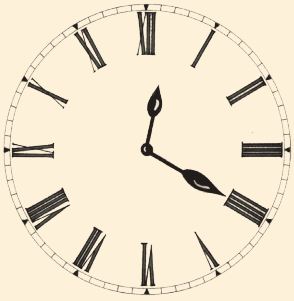
A range of question types and answering styles to keep learners engaged throughout

Sample page: Year 5 Autumn

25 The clocks show the start time and finish time for a sponsored silence.

How long was the silence?

start



finish

hr mins

meas

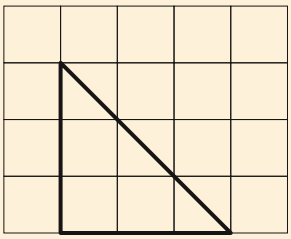
26 Gita has a 1 litre bottle of drink.

How many 200 ml cups can she fill?

cups

meas

27 Here is a triangle on a 1 cm square grid.



What is the **area** of the triangle?

cm^2

meas

page total

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Sample page: Year 5 Spring

21 Write the correct symbol in each box: **< > =**

$\frac{2}{3}$ ☐ $\frac{5}{6}$ frac

$\frac{3}{4}$ ☐ $\frac{8}{12}$ frac

22 Tick any **two** cards that give a total of 4

$2\frac{1}{2}$ $2\frac{1}{4}$ $2\frac{3}{4}$ $1\frac{3}{4}$ $1\frac{1}{4}$ frac

23 Work out:

50% of ☐ is 30 frac, PS

$\frac{1}{3}$ of ☐ is 30 frac, PS

$\frac{3}{4}$ of ☐ is 30 frac, PS

page total

Every question is mapped to **National Curriculum Content Domains** (as well as problem solving), fueling question and strand level analysis in Boost Insights

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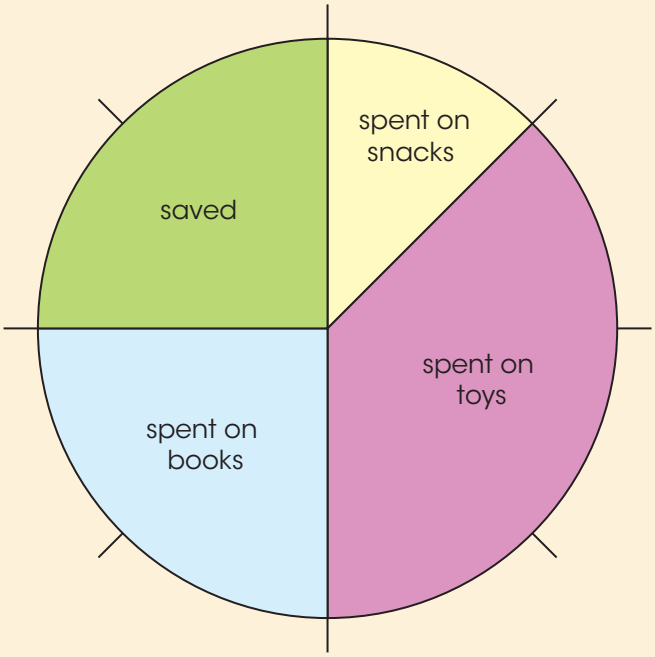
Sample page: Year 6 Summer

34 Omari received £40 for his birthday.

The pie chart shows what he did with the money.



(a) What **percentage** of his money did he save? ____ %

stat

(b) How much money did he spend on **toys**? £ ____

stat, PS

page total

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Sample page: Year 6 Autumn

37 Here are two mixed numbers.

$$1\frac{5}{6} \qquad 2\frac{7}{8}$$

(a) Write them as **improper fractions** with a **common denominator**.

and

frac, PS

(b) Write the **mixed number** that is exactly **halfway** between $1\frac{5}{6}$ and $2\frac{7}{8}$

frac, PS

page total

Total /55

Extension questions appear at the end of assessments to challenge learners working at great depth

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Meet the authors

The writers behind New PUMA are experts in test development.

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.

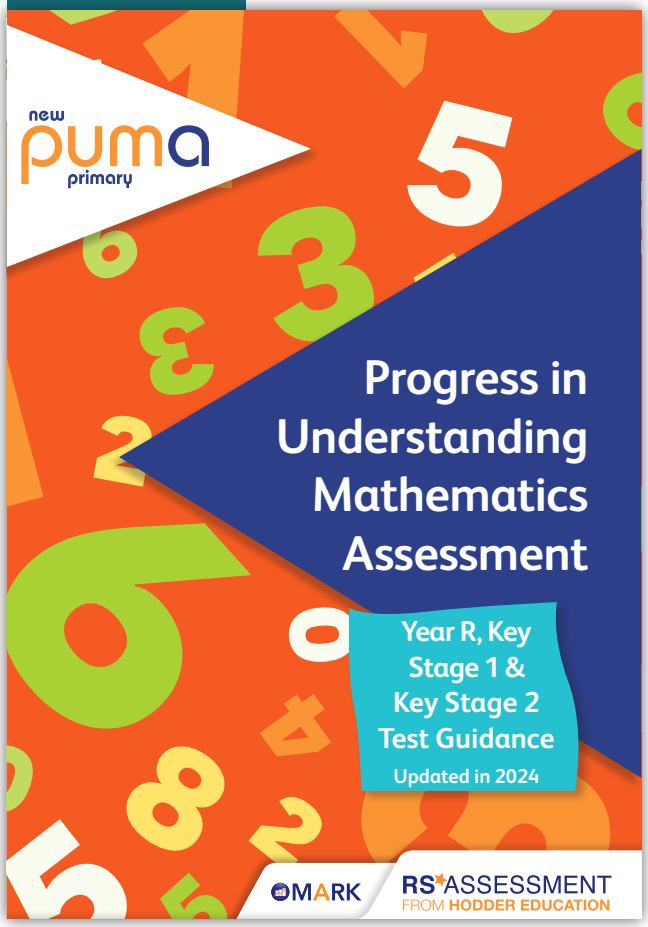
Test Guidance and Mark Schemes

Assessment resources to support all staff.

Free resources provide clear and thorough support to ensure optimal use of New PUMA in your school, including guidance on administering, marking and analysing assessment results.

- **Test Guidance** is given on interpreting test scores and outcomes, including summative measures, diagnostic and formative profiles, and performance predictions. Technical information is also provided on how we ensure the reliability and validity of these outcomes.
  - Teacher Scripts for Reception, Year 1 and Year 2 assessments are found within the Test Guidance.
- **Mark Schemes** provide correct answers to each question, alongside the strand reference and facility range.
- **Resources** are available online or to download from your Assessment Resources section in Boost Insights.

Free access



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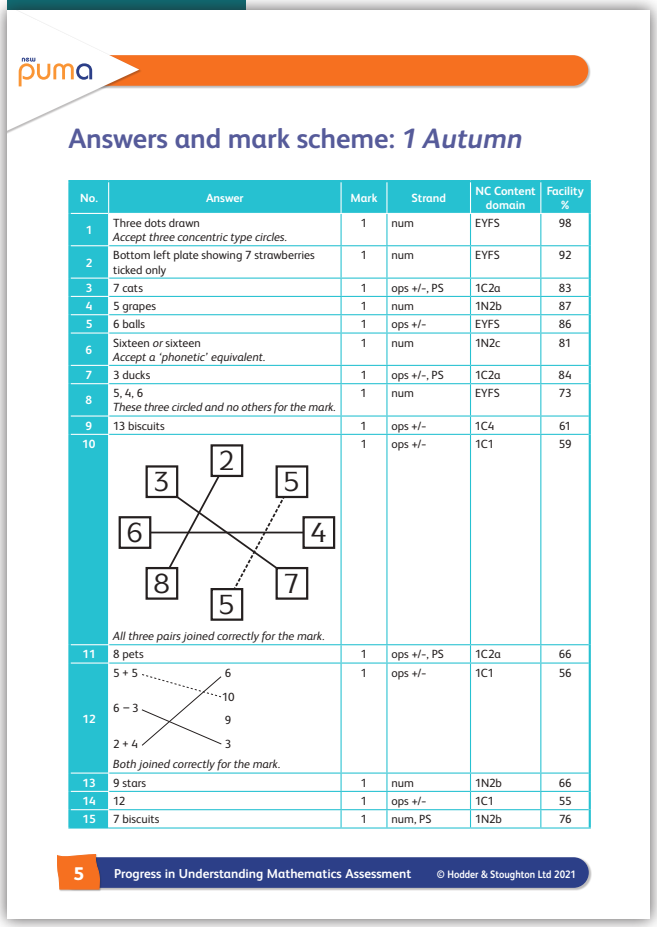

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Answers and mark scheme: *1 Autumn*

No.	Answer	Mark	Strand	NC Content domain	Facility %
1	Three dots drawn *Accept three concentric type circles.*	1	num	EYFS	98
2	Bottom left plate showing 7 strawberries ticked only	1	num	EYFS	92
3	7 cats	1	ops +/–, PS	1C2a	83
4	5 grapes	1	num	1N2b	87
5	6 balls	1	ops +/–	EYFS	86
6	Sixteen *or* sixteen *Accept a 'phonetic' equivalent.*	1	num	1N2c	81
7	3 ducks	1	ops +/–, PS	1C2a	84
8	5, 4, 6 *These three circled and no others for the mark.*	1	num	EYFS	73
9	13 biscuits	1	ops +/–	1C4	61
10	 *All three pairs joined correctly for the mark.*	1	ops +/–	1C1	59
11	8 pets	1	ops +/–, PS	1C2a	66
12	 *Both joined correctly for the mark.*	1	ops +/–	1C1	56
13	9 stars	1	num	1N2b	66
14	12	1	ops +/–	1C1	55
15	7 biscuits	1	num, PS	1N2b	76

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Assessment maps

Our free online assessment maps allow you to check the content 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 tests are administered.

They show a breakdown of areas covered in each assessment by strand, content domain and description.

Maps are available online or to download from your Assessment Resources section in Boost Insights.

Strand	Content Domain	Year 1 Autumn	Marks
Number	**ELGN**	Count reliably with numbers from 1 to 20	3
	1N2b	Given a number, identify one more and one less	3
	1N2c	Read and write numbers from 1 to 20 in numerals and words	1
Operations	**ELGN**	Using quantities and objects, they add and subtract two one-digit numbers and count on or back to find the answer	1
	1C1	Represent and use number bonds and related subtraction facts within 20 [this test only up to 10]	3
	1C2a	Add and subtract one-digit and two-digit numbers to 20, including zero [this test only up to 10]	3
	1C4	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = [ ] – 9	4
Measures	**ELGSSM**	Use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems	2
	1M4c	Recognise and use language relating to dates, including days of the week, weeks, months and years	1
Geometry	**ELGSSM**	Use everyday language to talk about position to compare objects	2
	ELGSSM	Use mathematical language to describe shapes	1
	1G1a	Recognise and name common 2-D shapes [e.g. rectangles (including squares), circles and triangles]	5
	1G1b	Recognise and name common 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]	1

Strand	Content Domain	Year 2 Autumn	Marks
Number	**1N1b**	Count in multiples of twos, fives and tens	3
	1N2a	Count, read and write numbers to 100 in numerals	2
	2N1	Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward or backward	1
	2N2b	Compare and order numbers from 0 up to 100; use <, > and = signs	1
	2N3	Recognise the place value of each digit in a two-digit number (tens and ones)	4
Operations	**1C1**	Represent and use number bonds and related subtraction facts within 20	2
	1C2a	Add and subtract one-digit and two-digit numbers to 20, including zero	3
	2C4	Solve problems with addition and subtraction: • applying their increasing knowledge of mental and written methods	2
	2C6	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	2
Fractions	**1F1a**	Recognise, find and name a half as one of two equal parts of an object, shape or quantity	1
	2F1a	Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	1
Measures	**1M1**	Compare, describe and solve practical problems for: • lengths and heights [e.g. long/short, longer/shorter,tall/short, double/half]	1
	1M2	Measure and begin to record the following: • lengths and heights	1
Geometry	**1G1a**	Recognise and name common 2-D shapes [e.g. rectangles (including squares), circles and triangles]	1
	1G1b	Recognise and name common 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]	1
Statistics	**2S1**	Interpret and construct simple pictograms, tally charts, block diagrams and simple tables	2
	2S2a	Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	1
	2S2b	Ask and answer questions about totalling and comparing categorical data	1

Strand	Content Domain	Year 3 Autumn	Marks
Number	**2N1**	Count in steps of 2, 3 and 5, from 0, and in tens from any number, forward or backward	2
	3N1b	Count from 0 in multiples of 4, 8, 50 and 100	1
	3N2a	Compare and order numbers up to 1000	1
	3N2b	Find 10 or 100 more or less than a given number	1
	3N3	Recognise the place value of each digit in a three-digit number (hundreds, tens and ones)	1
	3N4	Identify, represent and estimate numbers using different representations	1
	3N6	Solve number problems and practical problems involving 3N1–3N5	2
Operations	**2C1**	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	1
	2C2a	Add and subtract numbers mentally, including: • a two-digit number and ones • a two-digit number and tens • two two-digit numbers • adding three one-digit numbers	2
	2C3	Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems	1
	2C4	Solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods	3
	2C6	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	1
	2C8	Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts	2
	2C9a	Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	1
	3C1	Add and subtract numbers mentally, including: • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds	3
	3C2	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	1
	3C6	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	3
	3C8	Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems	1
Fractions	**1F1b**	Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	1
	2F1a	Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	3

Strand	Content Domain	Year 4 Autumn	Marks
Number	**2N6**	Use place values and number facts to solve problems	1
	3N3	Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	1
	3N4	Identify, represent and estimate numbers using different representations	3
	4N1	Count in multiples of 6, 7, 9, 25 and 1000	1
	4N2a	Order and compare numbers beyond 1000	1
	4N3a	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones)	3
	4N4a	Identify, represent and estimate numbers using different representations	1
	4N4b	Round any number to the nearest 10, 100 or 1000	2
	4N6	Solve number and practical problems that involve 4N1–4N5 and with increasingly large positive numbers	1
Operations	**2C2a**	Add and subtract numbers mentally, including: • adding three one-digit numbers	2
	2C4	solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods	1
	3C4	Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction	2
	3C8	Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects	2
	4C2	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	2
	4C3	Estimate and use inverse operations to check answers to a calculation	1
	4C4	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	2
	4C6c	Recognise and use factor pairs and commutativity in mental calculations	1
	4C7	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	1
	4C8	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	3

Fractions	**3F1b**	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	1
	3F1c	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	1
	3F2	Recognise and show, using diagrams, equivalent fractions with small denominators	2
Measures	**2M3a**	Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value	1
	3M2a	Measure lengths (m/cm/mm)	1
	4M9	Calculate different measures, including money in pounds and pence	2
Geometry	**2G2a**	Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line	1
	3G4b	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	2
Statistics	**3S1**	Interpret and present data using bar charts, pictograms and tables	2
	3S2	Solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presentedin scaled bar charts, pictograms and tables	1

Strand	Content Domain	Year 5 Autumn	Marks
Number	**3N1b**	Count from 0 in multiples of 4, 8, 50 and 100	1
	3N2a	Compare and order numbers up to 1000	2
	3N4	Identify, represent and estimate numbers using different representations	1
	3N6	Solve number problems and practical problems involving 3N1–3N5	2
	4N1	Count in multiples of 6, 7, 9, 25 and 1000	1
	4N4a	Identify, represent and estimate numbers using different representations	1
	4N5	Count backwards through zero to include negative numbers	1

Operations	**2C2**	Add and subtract numbers using concrete objects and pictorial representations, including: • two two-digit numbers	1
	3C4	Solve problems including missing number problems, using number facts, place value and more complex addition and subtraction	2
	4C4	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	1
	4C6a	Recall multiplication and division facts for multiplication tables up to 12 × 12	4
	4C7	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	1
	4C8	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	1
	5C5a	Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers	2
	5C5d	Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	1
	5C6a	Multiply and divide numbers mentally drawing upon known facts	1
	5C8b	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	5
Fractions	**3F2**	Recognise and show, using diagrams, equivalent fractions with small denominators	1
	4F2	Recognise and show, using diagrams, families of common equivalent fractions	1
	4F4	Add and subtract fractions with the same denominator	2
	4F10b	Solve simple measure and money problems involving fractions and decimals to two decimal places	1
	5F2a	Recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements >1 as a mixed number [e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]	1
Measures	**3M4f**	Compare durations of events [e.g. to calculate the time taken by particular events or tasks]	1
	4M5	Convert between different units of measurement [e.g. kilometre to metre; hour to minute]	1
	4M9	Calculate different measures, including money in pounds and pence	3
	5M7b	Calculate and compare the area of rectangles (including squares) and estimate the area of irregular shapes	3
	5M9b	Use all four operations to solve problems involving measure [e.g. length] using decimal notation, including scaling	1

Geometry	**3G3b**	Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	1
	3G4b	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	1
	4G2a	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	1
	5G3b	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	2
Statistics	**3S2**	Solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts, pictograms and tables	2
	4S2	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	1
	5S1	Complete, read and interpret information in tables, including timetables	4

Strand	Content Domain	Year 6 Autumn	Marks
Number	**3N1b**	Count from 0 in multiples of 4, 8, 50 and 100	1
	4N6	Solve number and practical problems that involve 4N1–4N5 and with increasingly large positive numbers	1
	5N3a	Determine the value of each digit in numbers up to 1,000,000	2
	5N6	Solve number problems and practical problems that involve 5N1–5N5	3
	6N6	Solve number problems and practical problems that involve 6N2–6N5	2
Operations	**3C2**	Add and subtract whole numbers with up to 3 digits, using formal written methods of columnar addition and subtraction	1
	4C2	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	3
	4C3	Estimate and use inverse operations to check answers to a calculation	2
	4C6a	Recall multiplication and division facts for multiplication tables up to 12 × 12	3
	5C2	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	1
	5C5a	Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers	1
	5C5b	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	1
	5C6a	Multiply and divide numbers mentally drawing upon known facts	1
	5C7b	Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	1
	6C4	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	1

Operations (continued)	**6C5**	Identify common factors, common multiples and prime numbers	1
	6C7a	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication	1
	6C7c	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context	2
	6C8	Solve problems involving addition, subtraction, multiplication and division	3
Fractions	**3F1b**	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	1
	3F3	Compare and order unit fractions and fractions with the same denominators	1
	4F2	Recognise and show, using diagrams, families of common equivalent fractions	2
	6R1	Solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts	2
	6R4	Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	1
	6F2	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	1
	6F3	Compare and order fractions, including fractions >1	1
	6F4	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	2
	6F11	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	1
Measures	**4M2**	Estimate different measures, including money in pounds and pence	1
	4M9	Calculate different measures, including money in pounds and pence	1
	5M4	Solve problems involving converting between units of time	1
	5M5	Convert between different units of metric measure [e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]	1
	6M5	Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation of up to three decimal places	1
Geometry	**3G4b**	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or lessthan a right angle	1
	6G2b	Describe simple 3-D shapes	2
Statistics	**5S2**	Solve comparison, sum and difference problems using information presented in a line graph	4

Unlock targeted interventions

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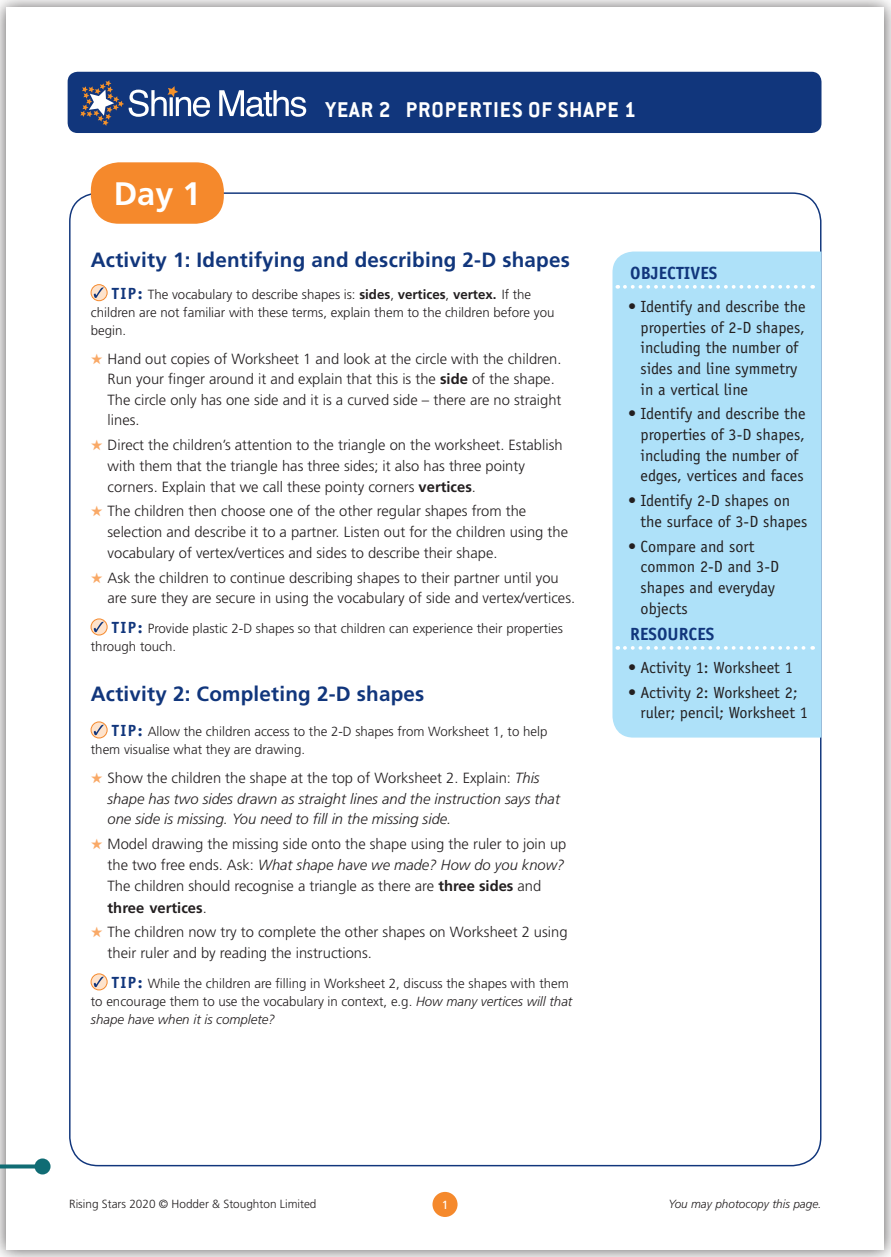

Shine Maths YEAR 2 PROPERTIES OF SHAPE 1

Day 1

Activity 1: Identifying and describing 2-D shapes

✓ **TIP:** The vocabulary to describe shapes is: **sides**, **vertices**, **vertex.** If the children are not familiar with these terms, explain them to the children before you begin.

- ★ Hand out copies of Worksheet 1 and look at the circle with the children. Run your finger around it and explain that this is the **side** of the shape. The circle only has one side and it is a curved side – there are no straight lines.
- ★ Direct the children's attention to the triangle on the worksheet. Establish with them that the triangle has three sides; it also has three pointy corners. Explain that we call these pointy corners **vertices**.
- ★ The children then choose one of the other regular shapes from the selection and describe it to a partner. Listen out for the children using the vocabulary of vertex/vertices and sides to describe their shape.
- ★ Ask the children to continue describing shapes to their partner until you are sure they are secure in using the vocabulary of side and vertex/vertices.

✓ **TIP:** Provide plastic 2-D shapes so that children can experience their properties through touch.

Activity 2: Completing 2-D shapes

✓ **TIP:** Allow the children access to the 2-D shapes from Worksheet 1, to help them visualise what they are drawing.

- ★ Show the children the shape at the top of Worksheet 2. Explain: *This shape has two sides drawn as straight lines and the instruction says that one side is missing. You need to fill in the missing side.*
- ★ Model drawing the missing side onto the shape using the ruler to join up the two free ends. Ask: *What shape have we made? How do you know?* The children should recognise a triangle as there are **three sides** and **three vertices**.
- ★ The children now try to complete the other shapes on Worksheet 2 using their ruler and by reading the instructions.

✓ **TIP:** While the children are filling in Worksheet 2, discuss the shapes with them to encourage them to use the vocabulary in context, e.g. *How many vertices will that shape have when it is complete?*

OBJECTIVES

- Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- Identify 2-D shapes on the surface of 3-D shapes
- Compare and sort common 2-D and 3-D shapes and everyday objects

RESOURCES

- Activity 1: Worksheet 1
- Activity 2: Worksheet 2; ruler; pencil; Worksheet 1

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Example delivery instructions from a Year 2 Learning Sequence on 2-D shapes.

30-day free trial available.

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- **Activity Worksheets** engage individuals or groups of learner with tasks that target the key learning objectives. Teaching tips help guide the activities with questions to encourage discussion and challenge misconceptions.
- Quick **Quizzes** at the end of each Learning Sequence measure a learners' understanding of the key objectives.
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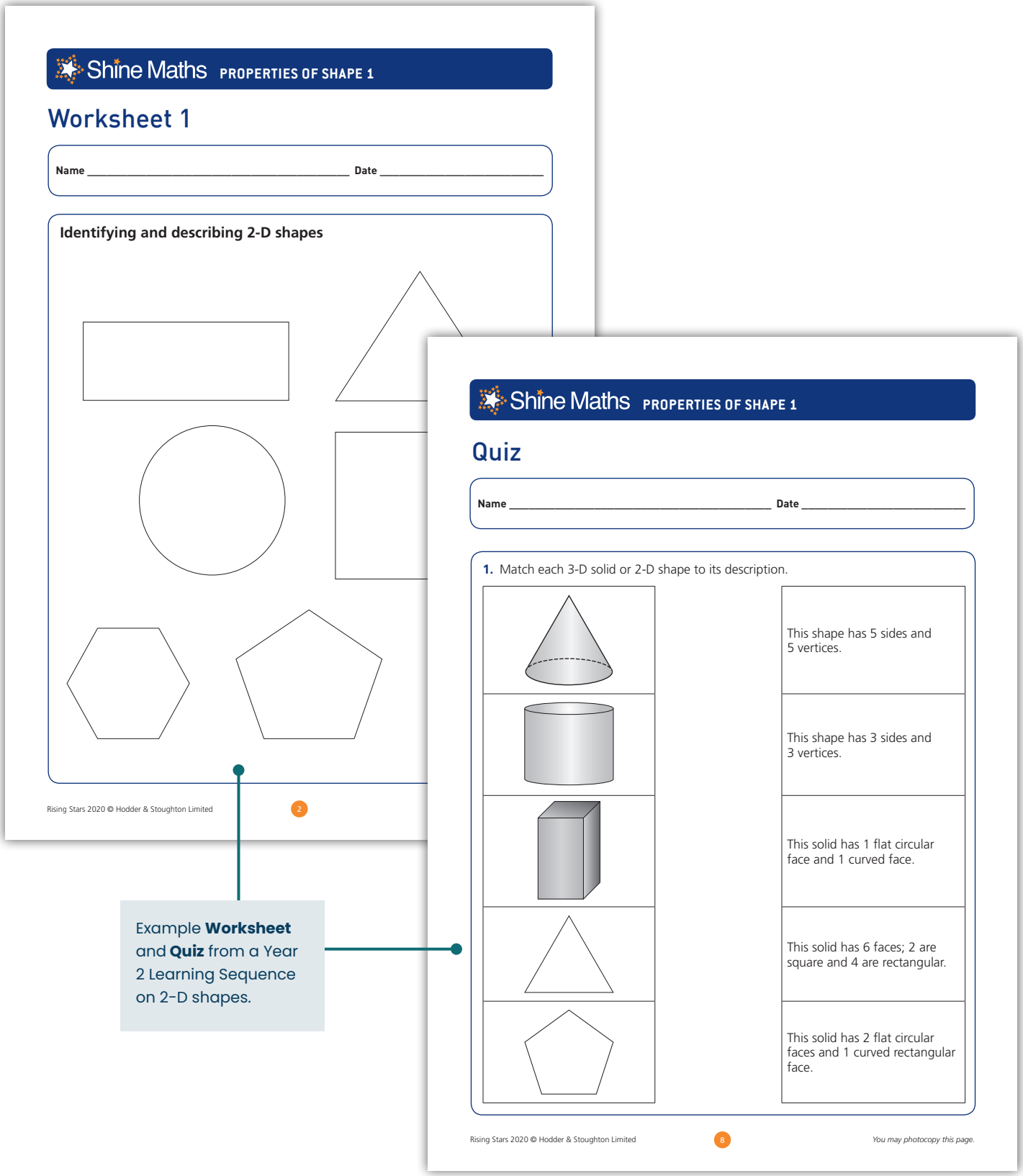

Shine Maths PROPERTIES OF SHAPE 1

Worksheet 1

Name _____ Date _____

Identifying and describing 2-D shapes

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Shine Maths PROPERTIES OF SHAPE 1

Quiz

Name _____ Date _____

1. Match each 3-D solid or 2-D shape to its description.

This shape has 5 sides and 5 vertices.

This shape has 3 sides and 3 vertices.

This solid has 1 flat circular face and 1 curved face.

This solid has 6 faces; 2 are square and 4 are rectangular.

This solid has 2 flat circular faces and 1 curved rectangular face.

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Example **Worksheet** and **Quiz** from a Year 2 Learning Sequence on 2-D shapes.

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