

THE COLOUR WORKS

VOLUME 2

The Back Room. Volume 1 got the workshop running. Volume 2 is the room nobody had opened yet — and there was more in it than expected.

Why there is a Volume 2

Volume 1 was checked against the official EQAO **Grade 3 Glossary** and against every expectation the assessment maps questions to. Two things came out of that.

What the check found	What Volume 2 does
Eight expectations were never covered at all	B2.7 groups of a half, third or quarter · C1.4 patterns up to a thousand · C2.1 how variables work · D1.2 tally and frequency tables · D1.5 graphs with different scales · D2.2 whether mean and mode match · E1.2 building and taking apart structures · E1.3 congruence .
Fifteen glossary words never appeared	<i>congruent, table of values, tally table, frequency, line plot, hundreds chart, octagon, position number, survey, analog clock, digital clock, even number, odd number, base ten materials, count backward</i> . Students can look the glossary up during the assessment — so knowing the words is worth marks.

Grade 3 students get the glossary too. Not just Grade 6. It is free from eqao.com, it is one page each way, and it lists the exact words the assessment uses. Print it.

Apprentice

Same rules as Volume 1. Nothing is timed. There is no way to lose. One sheet a day is plenty, and please do not mark it — the key at the back is for the child.

What Volume 2 adds

Seventeen sheets, twelve questions each. Every one is something Volume 1 never asked.

Sheets	What	Why it matters
3-10	The eight missing expectations	These are all fair game on the assessment. E1.3 congruence and C2.1 variables had no activity anywhere in Volume 1 – not one question.
11-19	The glossary words	Ontario's own analysis found language failures in every single mathematics strand – vocabulary, not calculation. A child who cannot separate <i>frequency</i> from <i>how many</i> , or <i>congruent</i> from <i>similar</i> , loses marks on mathematics they can actually do.
20-29	Ten weekly sets	Ten questions a week, mixed in blueprint proportion. Fifteen minutes. Short enough to sustain for a term.

Three things worth doing physically

Sheet 3 needs water. Ten cups each half full, poured together. Two halves make one whole is a fact a child can argue with on paper and cannot argue with in a jug.

Sheet 10 needs boxes. Congruence is nearly impossible from a picture and obvious with two identical tins in your hands.

Sheet 11 needs a real clock. If you have an analog clock in the house, move the hands. The five-minute jump between the numbers is the whole idea.

The one thing to say out loud. Extra time is allowed for every student on the real assessment – not just for some. Most children do not know that, and a surprising number of lost marks come from rushing to finish first.

Original questions throughout. The glossary and the Framework were read to work out *what to cover*; every question here was written for this book.

Halves, Thirds And Quarters Of A Group

NEW Strand B · Number and Financial Literacy — 14 of the 40 questions (35%) · B2.7

Ten jars each one half full. How many full jars is that? Try it with real cups of water.

- 1 Marigold pours 8 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 8 ☐ B 16
☐ C 4 ☐ D 6
- 2 Marigold pours 4 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 4 ☐ B 2
☐ C 8 ☐ D $4/3$
- 3 Marigold pours 8 jars, each one quarter full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 8 ☐ B 4
☐ C 32 ☐ D 2
- 4 Marigold pours 8 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 8 ☐ B 16
☐ C 4 ☐ D 6
- 5 Marigold pours 8 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 4 ☐ B 6
☐ C 16 ☐ D 8
- 6 Marigold pours 10 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 5 ☐ B 8
☐ C 10 ☐ D 20
- 7 Marigold pours 6 jars, each one third full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 3 ☐ B 2
☐ C 6 ☐ D 18
- 8 Marigold pours 4 jars, each one third full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 1 ☐ B $4/3$
☐ C 4 ☐ D 12
- 9 Marigold pours 8 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 4 ☐ B 8
☐ C 6 ☐ D 16
- 10 Marigold pours 6 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 3 ☐ B 6
☐ C 4 ☐ D 12
- 11 Marigold pours 12 jars, each one half full. How many full jars of paint is that altogether? (B2.7 · AP)
☐ A 10 ☐ B 24
☐ C 12 ☐ D 6

12 Marigold pours 6 jars, each one half full. How many full jars of paint is that altogether? B2.7 · AP

☐ A 6

☐ B 3

☐ C 12

☐ D 4

Twelve fresh questions. The answer key at the back gives the reason and the expectation code — for the child to check their own work afterwards, not for marking.

Patterns Up To A Thousand

NEW Strand C · Algebra — 8 of the 40 questions (20%) · C1.4

Counting on and back by tens and hundreds — and doubling, which grows much faster.

- 1 A pattern: 400, 500, 600, 700, ... What comes next? C1.4 · AP
☐ A 1700 ☐ B 710
☐ C 600 ☐ D 800
- 2 Counting backward: 800, 750, 700, 650, ... What comes next? C1.4 · AP
☐ A 550 ☐ B 700
☐ C 649 ☐ D 600
- 3 A pattern: 200, 300, 400, 500, ... What comes next? C1.4 · AP
☐ A 1500 ☐ B 510
☐ C 400 ☐ D 600
- 4 A pattern: 5, 10, 20, 40, ... What comes next? C1.4 · TH
☐ A 80 ☐ B 60
☐ C 120 ☐ D 45
- 5 A pattern: 400, 500, 600, 700, ... What comes next? C1.4 · AP
☐ A 800 ☐ B 710
☐ C 600 ☐ D 1700
- 6 Counting backward: 550, 500, 450, 400, ... What comes next? C1.4 · AP
☐ A 300 ☐ B 450
☐ C 350 ☐ D 399
- 7 A pattern: 100, 200, 300, 400, ... What comes next? C1.4 · AP
☐ A 410 ☐ B 300
☐ C 1400 ☐ D 500
- 8 Counting backward: 650, 550, 450, 350, ... What comes next? C1.4 · AP
☐ A 450 ☐ B 250
☐ C 150 ☐ D 349
- 9 A pattern: 140, 150, 160, 170, ... What comes next? C1.4 · AP
☐ A 180 ☐ B 171
☐ C 270 ☐ D 160
- 10 A pattern: 430, 440, 450, 460, ... What comes next? C1.4 · AP
☐ A 450 ☐ B 461
☐ C 470 ☐ D 560
- 11 A pattern: 100, 200, 300, 400, ... What comes next? C1.4 · AP
☐ A 410 ☐ B 1400
☐ C 500 ☐ D 300

12 A pattern: 100, 200, 300, 400, ... What comes next? C1.4 · AP

☐ A 410

☐ B 500

☐ C 1400

☐ D 300

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The Mystery Box

NEW Strand C · Algebra — 8 of the 40 questions (20%) · C2.1

A box, a shape or a letter can stand in for a number nobody has worked out yet.

- 1 What number goes in the box? $11 + \square = 19$ C2.1 · AP

☐ A 11
☐ C 30

☐ B 19
☐ D 8
- 2 What number goes in the box? $3 + \square = 8$ C2.1 · AP

☐ A 5
☐ C 3

☐ B 11
☐ D 8
- 3 If $\blacktriangle = 3$, what is $\blacktriangle + \blacktriangle$? C2.1 · AP

☐ A 3
☐ C 5

☐ B 9
☐ D 6
- 4 If $\blacktriangle = 5$, what is $\blacktriangle + \blacktriangle$? C2.1 · AP

☐ A 10
☐ C 7

☐ B 5
☐ D 15
- 5 In the number sentence $7 + \square = 12$, what does the $\square$ stand for? C2.1 · KU

☐ A a shape you have to draw
☐ B the answer to the whole sentence
☐ C a number we do not know yet
☐ D the number 7 again
- 6 If $\blacktriangle = 8$, what is $\blacktriangle + \blacktriangle$? C2.1 · AP

☐ A 8
☐ C 10

☐ B 24
☐ D 16
- 7 What number goes in the box? $13 + \square = 33$ C2.1 · AP

☐ A 13
☐ C 46

☐ B 33
☐ D 20
- 8 What number goes in the box? $10 + \square = 23$ C2.1 · AP

☐ A 23
☐ C 13

☐ B 33
☐ D 10
- 9 What number goes in the box? $5 + \square = 21$ C2.1 · AP

☐ A 21
☐ C 26

☐ B 5
☐ D 16
- 10 If $\blacktriangle = 9$, what is $\blacktriangle + \blacktriangle$? C2.1 · AP

☐ A 18
☐ C 27

☐ B 11
☐ D 9
- 11 What number goes in the box? $8 + \square = 13$ C2.1 · AP

☐ A 8
☐ C 21

☐ B 5
☐ D 13

12 In the number sentence $7 + \square = 12$, what does the $\square$ stand for? C2.1 · KU

- ☐ A the answer to the whole sentence
- ☐ B a shape you have to draw
- ☐ C the number 7 again
- ☐ D a number we do not know yet

.....
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Tally Tables And Frequency

NEW Strand D · Data — 8 of the 40 questions (20%) · D1.2

Frequency just means how many times. Tally marks come in groups of five.

- 1 Marigold wants to know which colour the whole school likes best. What should she do? D1.2 · TH
 - ☐ A guess, because she knows the shop well
 - ☐ B ask her three closest friends
 - ☐ C ask lots of people and record every answer in a tally table
 - ☐ D pick the colour she sells the most of
- 2 A tally table shows  for red. How many people chose red? D1.2 · KU
 - ☐ A 5
 - ☐ B 6
 - ☐ C 4
 - ☐ D 55
- 3 A frequency table of favourite colours: red = 5 · blue = 2 · green = 4 · yellow = 7. How many people were asked altogether? D1.2 · AP
 - ☐ A 7
 - ☐ B 18
 - ☐ C 4
 - ☐ D 16
- 4 A frequency table of favourite colours: red = 8 · blue = 2 · green = 3 · yellow = 8. How many people were asked altogether? D1.2 · AP
 - ☐ A 8
 - ☐ B 4
 - ☐ C 21
 - ☐ D 19
- 5 A frequency table of favourite colours: red = 3 · blue = 9 · green = 4 · yellow = 3. How many people were asked altogether? D1.2 · AP
 - ☐ A 16
 - ☐ B 19
 - ☐ C 9
 - ☐ D 4
- 6 A tally table shows  | for red. How many people chose red? D1.2 · KU
 - ☐ A 7
 - ☐ B 6
 - ☐ C 28
 - ☐ D 5
- 7 A tally table shows  |||| for red. How many people chose red? D1.2 · KU
 - ☐ A 10
 - ☐ B 5
 - ☐ C 8
 - ☐ D 9
- 8 Marigold wants to know which colour the whole school likes best. What should she do? D1.2 · TH
 - ☐ A ask her three closest friends
 - ☐ B pick the colour she sells the most of
 - ☐ C guess, because she knows the shop well
 - ☐ D ask lots of people and record every answer in a tally table
- 9 A frequency table of favourite colours: red = 9 · blue = 9 · green = 2 · yellow = 8. How many people were asked altogether? D1.2 · AP
 - ☐ A 4
 - ☐ B 28
 - ☐ C 9
 - ☐ D 26

10 Marigold wants to know which colour the whole school likes best. What should she do? D1.2 · TH

- ☐ A ask her three closest friends
- ☐ B pick the colour she sells the most of
- ☐ C ask lots of people and record every answer in a tally table
- ☐ D guess, because she knows the shop well

11 A frequency table of favourite colours: red = 7 · blue = 9 · green = 4 · yellow = 2.

How many people were asked altogether? D1.2 · AP

- | | |
|---------------------------|----------------------------|
| ☐ A 9 | ☐ B 20 |
| ☐ C 4 | ☐ D 22 |

12 A frequency table of favourite colours: red = 9 · blue = 9 · green = 5 · yellow = 8.

How many people were asked altogether? D1.2 · AP

- | | |
|----------------------------|----------------------------|
| ☐ A 26 | ☐ B 4 |
| ☐ C 9 | ☐ D 31 |

Twelve fresh questions. The answer key at the back gives the reason and the expectation code — for the child to check their own work afterwards, not for marking.

Read The Scale First

NEW Strand D · Data — 8 of the 40 questions (20%) · D1.5

One square might mean five pots. Read the key before you count anything.

- 1 A bar graph is scaled so that **one square = 5 pots**. The red bar is **6 squares** tall. How many pots is that?
D1.5 · AP
- ☐ A 6 ☐ B 5
☐ C 30 ☐ D 35
- 2 On a graph where **one square = 10 pots**, blue is **4 squares** and green is **3 squares**. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 1 ☐ B 14
☐ C 10 ☐ D 70
- 3 A bar graph is scaled so that **one square = 2 pots**. The red bar is **2 squares** tall. How many pots is that?
D1.5 · AP
- ☐ A 4 ☐ B 59
☐ C 6 ☐ D 2
- 4 On a graph where **one square = 10 pots**, blue is **5 squares** and green is **4 squares**. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 10 ☐ B 90
☐ C 70 ☐ D 1
- 5 On a graph where **one square = 5 pots**, green is **5 squares** and red is **8 squares**. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 65 ☐ B 40
☐ C 3 ☐ D 15
- 6 A bar graph is scaled so that **one square = 2 pots**. The green bar is **4 squares** tall. How many pots is that?
D1.5 · AP
- ☐ A 2 ☐ B 10
☐ C 8 ☐ D 4
- 7 A bar graph is scaled so that **one square = 2 pots**. The green bar is **4 squares** tall. How many pots is that?
D1.5 · AP
- ☐ A 10 ☐ B 8
☐ C 2 ☐ D 4
- 8 A bar graph is scaled so that **one square = 2 pots**. The green bar is **3 squares** tall. How many pots is that?
D1.5 · AP
- ☐ A 6 ☐ B 8
☐ C 3 ☐ D 2
- 9 On a graph where **one square = 2 pots**, green is **4 squares** and red is **7 squares**. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 3 ☐ B 14
☐ C 6 ☐ D 22

10 A bar graph is scaled so that **one square = 10 pots**. The red bar is **3 squares** tall. How many pots is that?

D1.5 · AP

☐ A 40

☐ B 10

☐ C 3

☐ D 30

11 On a graph where **one square = 2 pots**, blue is **5 squares** and green is **4 squares**. How many **more** pots is the taller one? D1.5 · TH

☐ A 1

☐ B 10

☐ C 18

☐ D 2

12 A bar graph is scaled so that **one square = 2 pots**. The red bar is **4 squares** tall. How many pots is that?

D1.5 · AP

☐ A 10

☐ B 4

☐ C 2

☐ D 8

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Mean And Mode Together

NEW Strand D · Data — 8 of the 40 questions (20%) · D2.2

Sometimes they match. Usually one odd number pulls them apart.

- 1 Brush sizes sold: 8, 8, 8, 8.
Are the **mean** and the **mode** the same? D2.2 · TH
 - ☐ A you cannot tell without more numbers
 - ☐ B only if you sort them first
 - ☐ C yes
 - ☐ D no
- 2 Brush sizes sold: 13, 5, 5, 5.
Are the **mean** and the **mode** the same? D2.2 · TH
 - ☐ A yes
 - ☐ B no
 - ☐ C you cannot tell without more numbers
 - ☐ D only if you sort them first
- 3 Brush sizes sold: 3, 3, 8, 3.
Are the **mean** and the **mode** the same? D2.2 · TH
 - ☐ A yes
 - ☐ B no
 - ☐ C you cannot tell without more numbers
 - ☐ D only if you sort them first
- 4 Brush sizes sold: 2, 6, 2, 2.
Are the **mean** and the **mode** the same? D2.2 · TH
 - ☐ A no
 - ☐ B yes
 - ☐ C only if you sort them first
 - ☐ D you cannot tell without more numbers
- 5 Brush sizes sold: 6, 6, 6, 6.
Are the **mean** and the **mode** the same? D2.2 · TH
 - ☐ A yes
 - ☐ B no
 - ☐ C only if you sort them first
 - ☐ D you cannot tell without more numbers
- 6 Brush sizes sold: 4, 4, 4, 10.
Are the **mean** and the **mode** the same? D2.2 · TH
 - ☐ A no
 - ☐ B you cannot tell without more numbers
 - ☐ C only if you sort them first
 - ☐ D yes

- 7 Brush sizes sold: 4, 4, 4, 4.
Are the **mean** and the **mode** the same? (D2.2 · TH)
- ☐ A no
- ☐ B only if you sort them first
- ☐ C you cannot tell without more numbers
- ☐ D yes
- 8 Brush sizes sold: 10, 2, 2, 2.
Are the **mean** and the **mode** the same? (D2.2 · TH)
- ☐ A you cannot tell without more numbers
- ☐ B only if you sort them first
- ☐ C yes
- ☐ D no
- 9 Brush sizes sold: 4, 4, 4, 11.
Are the **mean** and the **mode** the same? (D2.2 · TH)
- ☐ A you cannot tell without more numbers
- ☐ B only if you sort them first
- ☐ C yes
- ☐ D no
- 10 Brush sizes sold: 5, 5, 5, 5.
Are the **mean** and the **mode** the same? (D2.2 · TH)
- ☐ A only if you sort them first
- ☐ B yes
- ☐ C no
- ☐ D you cannot tell without more numbers
- 11 Brush sizes sold: 7, 7, 7, 7.
Are the **mean** and the **mode** the same? (D2.2 · TH)
- ☐ A you cannot tell without more numbers
- ☐ B yes
- ☐ C no
- ☐ D only if you sort them first
- 12 Brush sizes sold: 6, 6, 6, 6.
Are the **mean** and the **mode** the same? (D2.2 · TH)
- ☐ A yes
- ☐ B only if you sort them first
- ☐ C you cannot tell without more numbers
- ☐ D no

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Building And Taking Apart

NEW Strand E · Spatial Sense — 10 of the 40 questions (25%) · E1.2

Which solids is this made of? Build it with real boxes and tins.

- 1 Marigold builds a **rocket made of a cylinder with a cone on top**. Which shapes did she use? E1.2 · AP
 - ☐ A a cylinder and a cone
 - ☐ B two cubes and a square pyramid
 - ☐ C a cube and a triangular prism
 - ☐ D two cubes and a rectangular prism
- 2 Marigold builds a **house made of a cube with a triangular prism roof**. Which shapes did she use? E1.2 · AP
 - ☐ A two cubes and a square pyramid
 - ☐ B two cubes and a rectangular prism
 - ☐ C a cylinder and a cone
 - ☐ D a cube and a triangular prism
- 3 Marigold builds a **rocket made of a cylinder with a cone on top**. Which shapes did she use? E1.2 · AP
 - ☐ A a cube and a triangular prism
 - ☐ B two cubes and a rectangular prism
 - ☐ C two cubes and a square pyramid
 - ☐ D a cylinder and a cone
- 4 Marigold builds a **rocket made of a cylinder with a cone on top**. Which shapes did she use? E1.2 · AP
 - ☐ A a cube and a triangular prism
 - ☐ B two cubes and a rectangular prism
 - ☐ C a cylinder and a cone
 - ☐ D two cubes and a square pyramid
- 5 Marigold builds a **tower made of two cubes and a square pyramid on top**. Which shapes did she use? E1.2 · AP
 - ☐ A two cubes and a square pyramid
 - ☐ B a cylinder and a cone
 - ☐ C a cube and a triangular prism
 - ☐ D two cubes and a rectangular prism
- 6 Marigold builds a **bench made of two cubes with a rectangular prism across them**. Which shapes did she use? E1.2 · AP
 - ☐ A two cubes and a rectangular prism
 - ☐ B a cylinder and a cone
 - ☐ C a cube and a triangular prism
 - ☐ D two cubes and a square pyramid

7 Marigold builds a tower made of two cubes and a square pyramid on top. Which shapes did she use?

E1.2 · AP

- ☐ A two cubes and a square pyramid
- ☐ B a cube and a triangular prism
- ☐ C a cylinder and a cone
- ☐ D two cubes and a rectangular prism

8 Marigold builds a rocket made of a cylinder with a cone on top. Which shapes did she use? E1.2 · AP

- ☐ A two cubes and a rectangular prism
- ☐ B a cylinder and a cone
- ☐ C a cube and a triangular prism
- ☐ D two cubes and a square pyramid

9 Marigold builds a house made of a cube with a triangular prism roof. Which shapes did she use? E1.2 · AP

- ☐ A a cylinder and a cone
- ☐ B two cubes and a rectangular prism
- ☐ C two cubes and a square pyramid
- ☐ D a cube and a triangular prism

10 Marigold builds a rocket made of a cylinder with a cone on top. Which shapes did she use? E1.2 · AP

- ☐ A a cylinder and a cone
- ☐ B a cube and a triangular prism
- ☐ C two cubes and a square pyramid
- ☐ D two cubes and a rectangular prism

11 Marigold builds a rocket made of a cylinder with a cone on top. Which shapes did she use? E1.2 · AP

- ☐ A two cubes and a square pyramid
- ☐ B a cylinder and a cone
- ☐ C two cubes and a rectangular prism
- ☐ D a cube and a triangular prism

12 Marigold builds a rocket made of a cylinder with a cone on top. Which shapes did she use? E1.2 · AP

- ☐ A a cube and a triangular prism
- ☐ B two cubes and a rectangular prism
- ☐ C two cubes and a square pyramid
- ☐ D a cylinder and a cone

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Congruent

NEW Strand E · Spatial Sense — 10 of the 40 questions (25%) · E1.3

Exactly the same size AND shape. You could lay one on top of the other.

- 1 Two shapes are **congruent**. What does that mean? E1.3 · KU
 - ☐ A they both have four sides
 - ☐ B they are the same colour
 - ☐ C they are exactly the same size and the same shape
 - ☐ D one is bigger than the other
- 2 What is true about the faces of a **square pyramid**? E1.3 · AP
 - ☐ A none of the faces are congruent
 - ☐ B the faces come in three congruent pairs
 - ☐ C the four triangular faces are congruent
 - ☐ D all six faces are congruent squares
- 3 Two shapes are **congruent**. What does that mean? E1.3 · KU
 - ☐ A they are the same colour
 - ☐ B they both have four sides
 - ☐ C they are exactly the same size and the same shape
 - ☐ D one is bigger than the other
- 4 Two shapes are **congruent**. What does that mean? E1.3 · KU
 - ☐ A they are the same colour
 - ☐ B they are exactly the same size and the same shape
 - ☐ C one is bigger than the other
 - ☐ D they both have four sides
- 5 Two shapes are **congruent**. What does that mean? E1.3 · KU
 - ☐ A they are exactly the same size and the same shape
 - ☐ B one is bigger than the other
 - ☐ C they both have four sides
 - ☐ D they are the same colour
- 6 A square has sides of **5 cm**. Which shape is **congruent** to it? E1.3 · AP
 - ☐ A a triangle with 5 cm sides
 - ☐ B a square with 7 cm sides
 - ☐ C a rectangle 5 cm by 8 cm
 - ☐ D another square with 5 cm sides
- 7 Two shapes are **congruent**. What does that mean? E1.3 · KU
 - ☐ A they are exactly the same size and the same shape
 - ☐ B they both have four sides
 - ☐ C they are the same colour
 - ☐ D one is bigger than the other

- 8 What is true about the faces of a **rectangular prism**? (E1.3 · AP)
- ☐ A the four triangular faces are congruent
 - ☐ B none of the faces are congruent
 - ☐ C the faces come in three congruent pairs
 - ☐ D all six faces are congruent squares
- 9 A square has sides of **7 cm**. Which shape is **congruent** to it? (E1.3 · AP)
- ☐ A another square with 7 cm sides
 - ☐ B a triangle with 7 cm sides
 - ☐ C a square with 9 cm sides
 - ☐ D a rectangle 7 cm by 10 cm
- 10 A square has sides of **3 cm**. Which shape is **congruent** to it? (E1.3 · AP)
- ☐ A a triangle with 3 cm sides
 - ☐ B another square with 3 cm sides
 - ☐ C a rectangle 3 cm by 6 cm
 - ☐ D a square with 5 cm sides
- 11 Two shapes are **congruent**. What does that mean? (E1.3 · KU)
- ☐ A they are the same colour
 - ☐ B one is bigger than the other
 - ☐ C they both have four sides
 - ☐ D they are exactly the same size and the same shape
- 12 A square has sides of **7 cm**. Which shape is **congruent** to it? (E1.3 · AP)
- ☐ A another square with 7 cm sides
 - ☐ B a square with 9 cm sides
 - ☐ C a triangle with 7 cm sides
 - ☐ D a rectangle 7 cm by 10 cm

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Clock Faces

GLOSSARY Strand E · Spatial Sense — 10 of the 40 questions (25%) · E2.6

Each number on the face is five minutes. Analog and digital show the same time.

- 1 A **digital clock** shows **10:25**. Where is the **minute hand** on an **analog clock** showing the same time? E2.6 · AP
 - ☐ A pointing at the 8
 - ☐ B pointing at the 10
 - ☐ C pointing at the 25
 - ☐ D pointing at the 5 on the clock face
- 2 An **analog clock** has the hour hand just past 2 and the minute hand on the 9. What would a **digital clock** show? E2.6 · AP
 - ☐ A 2:00
 - ☐ B 9:02
 - ☐ C 2:09
 - ☐ D 2:45
- 3 A **digital clock** shows **9:55**. Where is the **minute hand** on an **analog clock** showing the same time? E2.6 · AP
 - ☐ A pointing at the 11 on the clock face
 - ☐ B pointing at the 2
 - ☐ C pointing at the 9
 - ☐ D pointing at the 55
- 4 An **analog clock** has the hour hand just past 5 and the minute hand on the 9. What would a **digital clock** show? E2.6 · AP
 - ☐ A 5:45
 - ☐ B 9:05
 - ☐ C 5:00
 - ☐ D 5:09
- 5 An **analog clock** has the hour hand just past 9 and the minute hand on the 12. What would a **digital clock** show? E2.6 · AP
 - ☐ A 9:15
 - ☐ B 74
 - ☐ C 9:00
 - ☐ D 0:09
- 6 An **analog clock** has the hour hand just past 7 and the minute hand on the 9. What would a **digital clock** show? E2.6 · AP
 - ☐ A 9:07
 - ☐ B 7:00
 - ☐ C 7:45
 - ☐ D 7:09
- 7 A **digital clock** shows **6:15**. Where is the **minute hand** on an **analog clock** showing the same time? E2.6 · AP
 - ☐ A pointing at the 6
 - ☐ B 59
 - ☐ C pointing at the 15
 - ☐ D pointing at the 3 on the clock face
- 8 An **analog clock** has the hour hand just past 10 and the minute hand on the 3. What would a **digital clock** show? E2.6 · AP
 - ☐ A 3:10
 - ☐ B 10:30
 - ☐ C 10:03
 - ☐ D 10:15

- 9 An **analog clock** has the hour hand just past **9** and the minute hand on the **6**. What would a **digital clock** show? (E2.6 · AP)
- ☐ A 6:09 ☐ B 9:30
- ☐ C 9:06 ☐ D 9:45
- 10 An **analog clock** has the hour hand just past **8** and the minute hand on the **12**. What would a **digital clock** show? (E2.6 · AP)
- ☐ A 0:08 ☐ B 8:15
- ☐ C 94 ☐ D 8:00
- 11 A **digital clock** shows **8:30**. Where is the **minute hand** on an **analog clock** showing the same time? (E2.6 · AP)
- ☐ A pointing at the 6 on the clock face
- ☐ B pointing at the 30
- ☐ C pointing at the 8
- ☐ D pointing at the 9
- 12 An **analog clock** has the hour hand just past **4** and the minute hand on the **3**. What would a **digital clock** show? (E2.6 · AP)
- ☐ A 4:30 ☐ B 4:03
- ☐ C 4:15 ☐ D 3:04

Twelve fresh questions. The answer key at the back gives the reason and the expectation code – for the child to check their own work afterwards, not for marking.

Tables Of Values

GLOSSARY Strand C · Algebra — 8 of the 40 questions (20%) · C1.2

Position number on the left, term value on the right. Two names for the same idea.

- 1 A table of values shows: $(1, 4) \cdot (2, 7) \cdot (3, 10)$
What is the term value when the position number is 5? C1.2 · AP
- ☐ A 15 ☐ B 16
☐ C 5 ☐ D 19
- 2 A table of values shows: $(1, 7) \cdot (2, 11) \cdot (3, 15)$
What is the term value when the position number is 9? C1.2 · AP
- ☐ A 9 ☐ B 36
☐ C 39 ☐ D 43
- 3 A table of values shows: $(1, 7) \cdot (2, 12) \cdot (3, 17)$
What is the term value when the position number is 8? C1.2 · AP
- ☐ A 47 ☐ B 42
☐ C 8 ☐ D 40
- 4 A table of values shows: $(1, 4) \cdot (2, 6) \cdot (3, 8)$
What is the term value when the position number is 9? C1.2 · AP
- ☐ A 20 ☐ B 22
☐ C 18 ☐ D 9
- 5 A table of values shows: $(1, 4) \cdot (2, 7) \cdot (3, 10)$
What is the term value when the position number is 5? C1.2 · AP
- ☐ A 15 ☐ B 16
☐ C 5 ☐ D 19
- 6 A table of values shows: $(1, 6) \cdot (2, 10) \cdot (3, 14)$
What is the term value when the position number is 9? C1.2 · AP
- ☐ A 42 ☐ B 9
☐ C 38 ☐ D 36
- 7 A table of values shows: $(1, 6) \cdot (2, 11) \cdot (3, 16)$
What is the term value when the position number is 7? C1.2 · AP
- ☐ A 36 ☐ B 41
☐ C 35 ☐ D 7
- 8 A table of values shows: $(1, 4) \cdot (2, 7) \cdot (3, 10)$
What is the term value when the position number is 8? C1.2 · AP
- ☐ A 24 ☐ B 8
☐ C 28 ☐ D 25
- 9 A table of values shows: $(1, 5) \cdot (2, 9) \cdot (3, 13)$
What is the term value when the position number is 9? C1.2 · AP
- ☐ A 9 ☐ B 41
☐ C 37 ☐ D 36

- 10 A table of values shows: $(1, 4) \cdot (2, 6) \cdot (3, 8)$

What is the term value when the position number is 8? C1.2 · AP

- ☐ A 20 ☐ B 16
☐ C 8 ☐ D 18

- 11 A table of values shows: $(1, 7) \cdot (2, 10) \cdot (3, 13)$

What is the term value when the position number is 8? C1.2 · AP

- ☐ A 24 ☐ B 31
☐ C 28 ☐ D 8

- 12 A table of values shows: $(1, 6) \cdot (2, 8) \cdot (3, 10)$

What is the term value when the position number is 9? C1.2 · AP

- ☐ A 9 ☐ B 22
☐ C 18 ☐ D 24

Twelve fresh questions. The answer key at the back gives the reason and the expectation code — for the child to check their own work afterwards, not for marking.

Line Plots

GLOSSARY Strand D · Data — 8 of the 40 questions (20%) · D1.3

One dot for each thing you counted, stacked above its number.

1 A line plot of brushes per jar:

1 •
2 ••
3 •
4 •••
5 •
6 ••

How many jars had 2 brushes? D1.3 · KU

- ☐ A 46
☐ C 3

- ☐ B 2
☐ D 10

2 A line plot of brushes per jar:

2 •
3 •••
5 ••

How many jars had 3 brushes? D1.3 · KU

- ☐ A 35
☐ C 6

- ☐ B 3
☐ D 4

3 A line plot of brushes per jar:

1 •
2 •
5 ••
6 ••

How many jars had 2 brushes? D1.3 · KU

- ☐ A 94
☐ C 1

- ☐ B 6
☐ D 2

4 A line plot of brushes per jar:

1 ••
2 •
3 •
4 •
5 •

How many jars had 4 brushes? D1.3 · KU

- ☐ A 1
☐ C 4

- ☐ B 6
☐ D 2

- 5 A line plot of brushes per jar:

1 •
2 ••••
3 •
4 •••
6 •

How many jars had 4 brushes? D1.3 · KU

☐ A 10
☐ C 85

☐ B 3
☐ D 4

- 6 A line plot of brushes per jar:

2 •
3 •
4 ••
5 •••
6 ••

How many jars had 4 brushes? D1.3 · KU

☐ A 9
☐ C 2

☐ B 3
☐ D 4

- 7 A line plot of brushes per jar:

1 ••••
3 ••
4 ••
6 •

How many jars had 1 brushes? D1.3 · KU

☐ A 9
☐ C 4

☐ B 5
☐ D 1

- 8 A line plot of brushes per jar:

1 •
2 ••
3 •
4 •
5 •••
6 •

How many jars had 6 brushes? D1.3 · KU

☐ A 2
☐ C 9

☐ B 6
☐ D 1

- 9 A line plot of brushes per jar:

1 ••••
4 •
6 ••••

How many jars had 6 brushes? D1.3 · KU

☐ A 9
☐ C 6

☐ B 4
☐ D 5

10 A line plot of brushes per jar:

1 ••
2 •
4 •
5 ••
6 ••

How many jars had 5 brushes? D1.3 · KU

- ☐ A 5
- ☐ B 8
- ☐ C 3
- ☐ D 2

11 A line plot of brushes per jar:

1 ••••
5 •
6 ••

How many jars had 6 brushes? D1.3 · KU

- ☐ A 3
- ☐ B 2
- ☐ C 7
- ☐ D 6

12 A line plot of brushes per jar:

1 •
3 ••
4 •
5 •
6 ••

How many jars had 3 brushes? D1.3 · KU

- ☐ A 3
- ☐ B 7
- ☐ C 2
- ☐ D 77

Twelve fresh questions. The answer key at the back gives the reason and the expectation code – for the child to check their own work afterwards, not for marking.

The Hundreds Chart

GLOSSARY

Strand B · Number and Financial Literacy — 14 of the 40 questions (35%) · B1.4

One square down is ten more. One square right is one more.

- 1 On a hundreds chart you are on 44. You move **one square down**. What number are you on? B1.4 · AP
☐ A 54 ☐ B 34
☐ C 144 ☐ D 45
- 2 On a hundreds chart you are on 72. You move **one square down**. What number are you on? B1.4 · AP
☐ A 62 ☐ B 82
☐ C 172 ☐ D 73
- 3 On a hundreds chart you are on 67. You move **one square down**. What number are you on? B1.4 · AP
☐ A 68 ☐ B 57
☐ C 77 ☐ D 167
- 4 On a hundreds chart you are on 45. You move **two squares right**. What number are you on? B1.4 · AP
☐ A 65 ☐ B 47
☐ C 55 ☐ D 43
- 5 Count **backward** by tens from 59. What is the **fourth** number you say? B1.4 · AP
☐ A 19 ☐ B 49
☐ C 29 ☐ D 39
- 6 On a hundreds chart you are on 14. You move **one square down**. What number are you on? B1.4 · AP
☐ A 24 ☐ B 15
☐ C 4 ☐ D 114
- 7 On a hundreds chart you are on 48. You move **two squares right**. What number are you on? B1.4 · AP
☐ A 58 ☐ B 68
☐ C 50 ☐ D 46
- 8 On a hundreds chart you are on 45. You move **one square down**. What number are you on? B1.4 · AP
☐ A 55 ☐ B 35
☐ C 46 ☐ D 145
- 9 On a hundreds chart you are on 68. You move **one square down**. What number are you on? B1.4 · AP
☐ A 69 ☐ B 58
☐ C 78 ☐ D 168
- 10 On a hundreds chart you are on 73. You move **two squares right**. What number are you on? B1.4 · AP
☐ A 83 ☐ B 71
☐ C 75 ☐ D 93
- 11 On a hundreds chart you are on 58. You move **one square down**. What number are you on? B1.4 · AP
☐ A 59 ☐ B 158
☐ C 48 ☐ D 68

12 Count backward by tens from 63. What is the fourth number you say? B1.4 · AP

☐ A 23

☐ B 53

☐ C 33

☐ D 43

Twelve fresh questions. The answer key at the back gives the reason and the expectation code — for the child to check their own work afterwards, not for marking.

Naming Shapes By Sides

GLOSSARY Strand E · Spatial Sense — 10 of the 40 questions (25%) · E1.1

Pentagon 5, hexagon 6, octagon 8. The name tells you the number.

- 1 How many sides does a **octagon** have? E1.1 · KU

☐ A 5
☐ C 4

☐ B 3
☐ D 8
- 2 Which shape has **8 sides**? E1.1 · KU

☐ A triangle
☐ C square

☐ B octagon
☐ D rectangle
- 3 How many sides does a **octagon** have? E1.1 · KU

☐ A 5
☐ C 3

☐ B 8
☐ D 4
- 4 How many sides does a **square** have? E1.1 · KU

☐ A 4
☐ C 3

☐ B 5
☐ D 6
- 5 Which shape has **4 sides**? E1.1 · KU

☐ A rectangle
☐ C hexagon

☐ B pentagon
☐ D triangle
- 6 Which shape has **4 sides**? E1.1 · KU

☐ A square
☐ C pentagon

☐ B triangle
☐ D hexagon
- 7 How many sides does a **triangle** have? E1.1 · KU

☐ A 4
☐ C 6

☐ B 5
☐ D 3
- 8 How many sides does a **hexagon** have? E1.1 · KU

☐ A 3
☐ C 6

☐ B 5
☐ D 4
- 9 How many sides does a **triangle** have? E1.1 · KU

☐ A 5
☐ C 6

☐ B 3
☐ D 4
- 10 How many sides does a **pentagon** have? E1.1 · KU

☐ A 3
☐ C 5

☐ B 6
☐ D 4
- 11 How many sides does a **triangle** have? E1.1 · KU

☐ A 4
☐ C 5

☐ B 6
☐ D 3

12 Which shape has 8 sides? E1.1 · KU

☐ A octagon

☐ C rectangle

☐ B triangle

☐ D square

Twelve fresh questions. The answer key at the back gives the reason and the expectation code – for the child to check their own work afterwards, not for marking.

Even And Odd

GLOSSARY Strand B · Number and Financial Literacy — 14 of the 40 questions (35%) · B1.1

Look only at the last digit. Even numbers share into two equal groups.

- 1 Is 138 an even number or an odd number? B1.1 · KU

☐ A even
☐ C both

☐ B odd
☐ D neither
- 2 Is 191 an even number or an odd number? B1.1 · KU

☐ A odd
☐ C neither

☐ B both
☐ D even
- 3 Is 119 an even number or an odd number? B1.1 · KU

☐ A neither
☐ C even

☐ B both
☐ D odd
- 4 Is 35 an even number or an odd number? B1.1 · KU

☐ A odd
☐ C neither

☐ B even
☐ D both
- 5 Is 165 an even number or an odd number? B1.1 · KU

☐ A even
☐ C both

☐ B neither
☐ D odd
- 6 Is 154 an even number or an odd number? B1.1 · KU

☐ A neither
☐ C both

☐ B even
☐ D odd
- 7 Is 98 an even number or an odd number? B1.1 · KU

☐ A both
☐ C even

☐ B odd
☐ D neither
- 8 Is 44 an even number or an odd number? B1.1 · KU

☐ A both
☐ C even

☐ B neither
☐ D odd
- 9 Is 105 an even number or an odd number? B1.1 · KU

☐ A even
☐ C both

☐ B neither
☐ D odd
- 10 Is 159 an even number or an odd number? B1.1 · KU

☐ A both
☐ C even

☐ B odd
☐ D neither
- 11 Is 26 an even number or an odd number? B1.1 · KU

☐ A even
☐ C neither

☐ B both
☐ D odd

12 Is 74 an even number or an odd number? B1.1 · KU

☐ A even

☐ C odd

☐ B both

☐ D neither

Twelve fresh questions. The answer key at the back gives the reason and the expectation code – for the child to check their own work afterwards, not for marking.

Base Ten Materials And Expanded Form

GLOSSARY Strand B · Number and Financial Literacy — 14 of the 40 questions (35%) · B1.5

A flat is a hundred, a rod is ten, a cube is one.

- 1 Which is the **expanded form** of 392? B1.5 · KU
- ☐ A $300 + 90 + 2$ ☐ B $3 + 9 + 2$
- ☐ C $392 + 0$ ☐ D $300 + 9 + 20$
- 2 Which is the **expanded form** of 109? B1.5 · KU
- ☐ A $1 + 0 + 9$ ☐ B $100 + 0 + 90$
- ☐ C $100 + 9$ ☐ D $109 + 0$
- 3 Which is the **expanded form** of 166? B1.5 · KU
- ☐ A $166 + 0$ ☐ B $100 + 6 + 60$
- ☐ C $1 + 6 + 6$ ☐ D $100 + 60 + 6$
- 4 Which is the **expanded form** of 687? B1.5 · KU
- ☐ A $6 + 8 + 7$ ☐ B $600 + 80 + 7$
- ☐ C $600 + 8 + 70$ ☐ D $687 + 0$
- 5 With **base ten materials**, 3 hundred-flats, 3 ten-rods and 8 unit-cubes are laid out. What number is that? B1.5 · KU
- ☐ A 14 ☐ B 383
- ☐ C 338 ☐ D 68
- 6 Which is the **expanded form** of 803? B1.5 · KU
- ☐ A $800 + 3$ ☐ B $8 + 0 + 3$
- ☐ C $800 + 0 + 30$ ☐ D $803 + 0$
- 7 Which is the **expanded form** of 128? B1.5 · KU
- ☐ A $1 + 2 + 8$ ☐ B $100 + 2 + 80$
- ☐ C $128 + 0$ ☐ D $100 + 20 + 8$
- 8 Which is the **expanded form** of 339? B1.5 · KU
- ☐ A $300 + 30 + 9$ ☐ B $3 + 3 + 9$
- ☐ C $339 + 0$ ☐ D $300 + 3 + 90$
- 9 With **base ten materials**, 8 hundred-flats, 2 ten-rods and 7 unit-cubes are laid out. What number is that? B1.5 · KU
- ☐ A 872 ☐ B 17
- ☐ C 107 ☐ D 827
- 10 Which is the **expanded form** of 857? B1.5 · KU
- ☐ A $8 + 5 + 7$ ☐ B $857 + 0$
- ☐ C $800 + 5 + 70$ ☐ D $800 + 50 + 7$
- 11 Which is the **expanded form** of 888? B1.5 · KU
- ☐ A $800 + 80 + 8$ ☐ B $800 + 8 + 80$
- ☐ C $8 + 8 + 8$ ☐ D $888 + 0$

12 With **base ten materials**, 6 hundred-flats, 9 ten-rods and 5 unit-cubes are laid out. What number is that?

B1.5 · KU

☐ A 695

☐ B 155

☐ C 20

☐ D 659

Twelve fresh questions. The answer key at the back gives the reason and the expectation code – for the child to check their own work afterwards, not for marking.

The Pattern Core

GLOSSARY Strand C · Algebra — 8 of the 40 questions (20%) · C1.1

The smallest bit that starts over. Some people call it the repeating unit.

- 1 A border repeats: ▲ ● ▲ ● ▲ ●
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 3 ☐ B 2
☐ C 4 ☐ D 6
- 2 A border repeats: ■ ■ ▲ ■ ■ ▲ ■ ■ ▲
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 6 ☐ B 3
☐ C 4 ☐ D 9
- 3 A border repeats: ● ▲ ▲ ■ ● ▲ ▲ ■ ● ▲ ▲ ■
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 5 ☐ B 12
☐ C 8 ☐ D 4
- 4 A border repeats: ● ▲ ▲ ■ ● ▲ ▲ ■ ● ▲ ▲ ■
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 12 ☐ B 8
☐ C 4 ☐ D 5
- 5 A border repeats: ★ ● ★ ★ ● ★ ★ ● ★
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 9 ☐ B 4
☐ C 3 ☐ D 6
- 6 A border repeats: ■ ■ ▲ ■ ■ ▲ ■ ■ ▲
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 9 ☐ B 4
☐ C 6 ☐ D 3
- 7 A border repeats: ● ▲ ▲ ■ ● ▲ ▲ ■ ● ▲ ▲ ■
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 8 ☐ B 4
☐ C 12 ☐ D 5
- 8 A border repeats: ▲ ● ▲ ● ▲ ●
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 3 ☐ B 2
☐ C 4 ☐ D 6
- 9 A border repeats: ■ ■ ▲ ■ ■ ▲ ■ ■ ▲
How many shapes are in the **pattern core**? C1.1 · KU
☐ A 4 ☐ B 9
☐ C 3 ☐ D 6

10 A border repeats: ★ • ★ ★ • ★ ★ • ★
How many shapes are in the **pattern core**? C1.1 · KU

☐ A 3

☐ C 4

☐ B 6

☐ D 9

11 A border repeats: ▲ • ▲ • ▲ •
How many shapes are in the **pattern core**? C1.1 · KU

☐ A 3

☐ C 4

☐ B 6

☐ D 2

12 A border repeats: ▲ • ▲ • ▲ •
How many shapes are in the **pattern core**? C1.1 · KU

☐ A 3

☐ C 4

☐ B 2

☐ D 6

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Congruent Pairs

GLOSSARY Strand E · Spatial Sense — 10 of the 40 questions (25%) · E1.3

More than one answer is right. Same perimeter is not the same as congruent.

- 1 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A a square and a rectangle with the same perimeter
- ☐ B two squares with 5 cm sides
- ☐ C two triangles with the same base
- ☐ D the two ends of a cylinder
- ☐ E a cube face and a cube edge

- 2 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A the two ends of a cylinder
- ☐ B a square and a rectangle with the same perimeter
- ☐ C two triangles with the same base
- ☐ D a cube face and a cube edge
- ☐ E two squares with 5 cm sides

- 3 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A a square and a rectangle with the same perimeter
- ☐ B a cube face and a cube edge
- ☐ C two squares with 5 cm sides
- ☐ D the two ends of a cylinder
- ☐ E two triangles with the same base

- 4 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A a square and a rectangle with the same perimeter
- ☐ B a cube face and a cube edge
- ☐ C the two ends of a cylinder
- ☐ D two triangles with the same base
- ☐ E two squares with 5 cm sides

- 5 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A two squares with 5 cm sides
- ☐ B a square and a rectangle with the same perimeter
- ☐ C two triangles with the same base
- ☐ D the two ends of a cylinder
- ☐ E a cube face and a cube edge

- 6 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A the two ends of a cylinder
- ☐ B a cube face and a cube edge
- ☐ C a square and a rectangle with the same perimeter
- ☐ D two squares with 5 cm sides
- ☐ E two triangles with the same base

- 7 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A the two ends of a cylinder
- ☐ B a square and a rectangle with the same perimeter
- ☐ C a cube face and a cube edge
- ☐ D two triangles with the same base
- ☐ E two squares with 5 cm sides

- 8 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A a square and a rectangle with the same perimeter
- ☐ B two triangles with the same base
- ☐ C two squares with 5 cm sides
- ☐ D a cube face and a cube edge
- ☐ E the two ends of a cylinder

- 9 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A a square and a rectangle with the same perimeter
- ☐ B the two ends of a cylinder
- ☐ C two squares with 5 cm sides
- ☐ D a cube face and a cube edge
- ☐ E two triangles with the same base

- 10 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A two triangles with the same base
- ☐ B a square and a rectangle with the same perimeter
- ☐ C two squares with 5 cm sides
- ☐ D a cube face and a cube edge
- ☐ E the two ends of a cylinder

- 11 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A two triangles with the same base
- ☐ B two squares with 5 cm sides
- ☐ C a cube face and a cube edge
- ☐ D the two ends of a cylinder
- ☐ E a square and a rectangle with the same perimeter

12 Select **every** pair of shapes that must be **congruent**. (E1.3 · TH)

Fill in every box that applies.

- ☐ A the two ends of a cylinder
- ☐ B two triangles with the same base
- ☐ C a cube face and a cube edge
- ☐ D two squares with 5 cm sides
- ☐ E a square and a rectangle with the same perimeter

Twelve fresh questions. The answer key at the back gives the reason and the expectation code – for the child to check their own work afterwards, not for marking.

Week 1

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 Is **176** an even number or an odd number? B1.1 · KU

☐ A odd
☐ C neither

☐ B even
☐ D both
- 2 On a **hundreds chart** you are on **27**. You move **one square down**. What number are you on? B1.4 · AP

☐ A 28
☐ C 127

☐ B 17
☐ D 37
- 3 Marigold pours 4 jars, each **one quarter** full. How many **full jars** of paint is that altogether? B2.7 · AP

☐ A 16
☐ C 0

☐ B 1
☐ D 4
- 4 Which is the **expanded form** of **796**? B1.5 · KU

☐ A $796 + 0$
☐ C $700 + 90 + 6$

☐ B $700 + 9 + 60$
☐ D $7 + 9 + 6$
- 5 A **digital clock** shows **1:35**. Where is the **minute hand** on an **analog clock** showing the same time? E2.6 · AP

☐ A pointing at the 7 on the clock face
☐ B pointing at the 35
☐ C pointing at the 1
☐ D pointing at the 10
- 6 Marigold builds a **tower made of two cubes and a square pyramid on top**. Which shapes did she use? E1.2 · AP

☐ A two cubes and a rectangular prism
☐ B a cylinder and a cone
☐ C two cubes and a square pyramid
☐ D a cube and a triangular prism
- 7 A pattern: **400, 500, 600, 700, ...** What comes next? C1.4 · AP

☐ A 1700
☐ C 710

☐ B 600
☐ D 800
- 8 A border repeats: **▲ ● ▲ ● ▲ ●**
 How many shapes are in the **pattern core**? C1.1 · KU

☐ A 6
☐ C 3

☐ B 2
☐ D 4

9 Brush sizes sold: 4, 4, 11, 4.

Are the **mean** and the **mode** the same? (D2.2 · TH)

- ☐ A only if you sort them first
- ☐ B no
- ☐ C you cannot tell without more numbers
- ☐ D yes

10 On a graph where **one square = 2 pots**, red is **6 squares** and blue is **6 squares**. How many **more** pots is the taller one? (D1.5 · TH)

- | | |
|----------------------------|----------------------------|
| ☐ A 24 | ☐ B 0 |
| ☐ C 12 | ☐ D 54 |

Weekly beats daily. Mark against the expectation code, not out of ten. A code missed twice is worth teaching; one miss is noise.

Week 2

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 Count backward by tens from 63. What is the fourth number you say? (B1.4 · AP)

☐ A 23
☐ C 33

☐ B 53
☐ D 43
- 2 Marigold pours 10 jars, each one third full. How many full jars of paint is that altogether? (B2.7 · AP)

☐ A 30
☐ C 10/3

☐ B 10
☐ D 7
- 3 Which is the expanded form of 894? (B1.5 · KU)

☐ A $8 + 9 + 4$
☐ C $800 + 90 + 4$

☐ B $800 + 9 + 40$
☐ D $894 + 0$
- 4 Is 88 an even number or an odd number? (B1.1 · KU)

☐ A even
☐ C odd

☐ B both
☐ D neither
- 5 Select every pair of shapes that must be congruent. (E1.3 · TH)
 Fill in every box that applies.

☐ A the two ends of a cylinder
☐ B a cube face and a cube edge
☐ C a square and a rectangle with the same perimeter
☐ D two squares with 5 cm sides
☐ E two triangles with the same base
- 6 A digital clock shows 10:45. Where is the minute hand on an analog clock showing the same time? (E2.6 · AP)

☐ A pointing at the 9 on the clock face
☐ B pointing at the 12
☐ C pointing at the 45
☐ D pointing at the 10
- 7 A border repeats: $\blacktriangle \bullet \blacktriangle \bullet \blacktriangle \bullet$
 How many shapes are in the pattern core? (C1.1 · KU)

☐ A 2
☐ C 6

☐ B 4
☐ D 3
- 8 A table of values shows: $(1, 3) \cdot (2, 5) \cdot (3, 7)$
 What is the term value when the position number is 9? (C1.2 · AP)

☐ A 19
☐ C 21

☐ B 18
☐ D 9

- 9 On a graph where **one square = 10 pots**, red is **6** squares and blue is **6** squares. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 12 ☐ B 120
☐ C 0 ☐ D 60
- 10 A **frequency table** of favourite colours: red = 3 · blue = 9 · green = 2 · yellow = 9. How many people were asked altogether? D1.2 · AP
- ☐ A 9 ☐ B 21
☐ C 4 ☐ D 23

.....

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Week 3

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 Marigold pours 12 jars, each one quarter full. How many full jars of paint is that altogether? B2.7 · AP

☐ A 8
☐ C 12

☐ B 3
☐ D 48
- 2 Which is the expanded form of 681? B1.5 · KU

☐ A $681 + 0$
☐ C $6 + 8 + 1$

☐ B $600 + 8 + 10$
☐ D $600 + 80 + 1$
- 3 Is 71 an even number or an odd number? B1.1 · KU

☐ A both
☐ C odd

☐ B even
☐ D neither
- 4 Count backward by tens from 117. What is the fourth number you say? B1.4 · AP

☐ A 87
☐ C 77

☐ B 107
☐ D 97
- 5 A square has sides of 5 cm. Which shape is congruent to it? E1.3 · AP

☐ A a rectangle 5 cm by 8 cm
☐ B a triangle with 5 cm sides
☐ C a square with 7 cm sides
☐ D another square with 5 cm sides
- 6 Select every pair of shapes that must be congruent. E1.3 · TH
 Fill in every box that applies.

☐ A two squares with 5 cm sides
☐ B a cube face and a cube edge
☐ C two triangles with the same base
☐ D a square and a rectangle with the same perimeter
☐ E the two ends of a cylinder
- 7 A table of values shows: $(1, 4) \cdot (2, 7) \cdot (3, 10)$
 What is the term value when the position number is 9? C1.2 · AP

☐ A 27
☐ C 9

☐ B 28
☐ D 31
- 8 If $\blacktriangle = 3$, what is $\blacktriangle + \blacktriangle$? C2.1 · AP

☐ A 5
☐ C 9

☐ B 3
☐ D 6
- 9 A tally table shows  for red. How many people chose red? D1.2 · KU

☐ A 5
☐ C 9

☐ B 8
☐ D 10

10 A line plot of brushes per jar:



How many jars had 3 brushes? D1.3 · KU

- ☐ A 3
- ☐ B 9
- ☐ C 59
- ☐ D 2

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Week 4

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 With **base ten materials**, 8 hundred-flats, 5 ten-rods and 0 unit-cubes are laid out. What number is that?

(B1.5 · KU)

- ☐ A 850
 ☐ B 805
☐ C 13
 ☐ D 130

- 2 Is **134** an **even number** or an **odd number**? (B1.1 · KU)

- ☐ A both
 ☐ B even
☐ C neither
 ☐ D odd

- 3 **Count backward** by tens from **98**. What is the **fourth** number you say? (B1.4 · AP)

- ☐ A 68
 ☐ B 88
☐ C 58
 ☐ D 78

- 4 Marigold pours **8** jars, each **one quarter** full. How many **full** jars of paint is that altogether? (B2.7 · AP)

- ☐ A 8
 ☐ B 32
☐ C 4
 ☐ D 2

- 5 Which shape has **4 sides**? (E1.1 · KU)

- ☐ A triangle
 ☐ B square
☐ C hexagon
 ☐ D pentagon

- 6 Two shapes are **congruent**. What does that mean? (E1.3 · KU)

- ☐ A they both have four sides
☐ B one is bigger than the other
☐ C they are exactly the same size and the same shape
☐ D they are the same colour

- 7 If $\blacktriangle = 4$, what is $\blacktriangle + \blacktriangle$? (C2.1 · AP)

- ☐ A 8
 ☐ B 4
☐ C 6
 ☐ D 12

- 8 A pattern: **5, 10, 20, 40, ...** What comes next? (C1.4 · TH)

- ☐ A 60
 ☐ B 45
☐ C 80
 ☐ D 120

9 A line plot of brushes per jar:

1 •
2 •
3 •
4 •
5 ••••
6 •

How many jars had 6 brushes? D1.3 · KU

☐ A 2
☐ C 1

☐ B 9
☐ D 6

10 Brush sizes sold: 9, 9, 9, 9.

Are the **mean** and the **mode** the same? D2.2 · TH

☐ A no
☐ B you cannot tell without more numbers
☐ C yes
☐ D only if you sort them first

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Week 5

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- Is **90** an **even** number or an **odd** number? (B1.1 · KU)
 - ☐ A even
 - ☐ B odd
 - ☐ C neither
 - ☐ D both
- Count **backward** by tens from **105**. What is the **fourth** number you say? (B1.4 · AP)
 - ☐ A 95
 - ☐ B 85
 - ☐ C 75
 - ☐ D 65
- Marigold pours **6** jars, each **one third** full. How many **full** jars of paint is that altogether? (B2.7 · AP)
 - ☐ A 3
 - ☐ B 6
 - ☐ C 18
 - ☐ D 2
- Which is the **expanded form** of **227**? (B1.5 · KU)
 - ☐ A $2 + 2 + 7$
 - ☐ B $200 + 20 + 7$
 - ☐ C $200 + 2 + 70$
 - ☐ D $227 + 0$
- Marigold builds a **tower made of two cubes and a square pyramid on top**. Which shapes did she use? (E1.2 · AP)
 - ☐ A two cubes and a square pyramid
 - ☐ B a cylinder and a cone
 - ☐ C two cubes and a rectangular prism
 - ☐ D a cube and a triangular prism
- How many **sides** does a **pentagon** have? (E1.1 · KU)
 - ☐ A 6
 - ☐ B 5
 - ☐ C 3
 - ☐ D 4
- A pattern: **3, 6, 12, 24, ...** What comes next? (C1.4 · TH)
 - ☐ A 36
 - ☐ B 72
 - ☐ C 27
 - ☐ D 48
- A border repeats: **▲ ● ▲ ● ▲ ●**
How many shapes are in the **pattern core**? (C1.1 · KU)
 - ☐ A 4
 - ☐ B 2
 - ☐ C 3
 - ☐ D 6
- Brush sizes sold: **13, 3, 3, 3**.
Are the **mean** and the **mode** the same? (D2.2 · TH)
 - ☐ A no
 - ☐ B only if you sort them first
 - ☐ C you cannot tell without more numbers
 - ☐ D yes

- 10 On a graph where **one square = 5 pots**, green is **3 squares** and red is **8 squares**. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 25

☐ B 40

☐ C 5

☐ D 55

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Week 6

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 On a **hundreds chart** you are on **61**. You move **one square down**. What number are you on? B1.4 · AP

☐ A 161
☐ C 71

☐ B 62
☐ D 51
- 2 Marigold pours **12 jars**, each **one quarter** full. How many **full jars** of paint is that altogether? B2.7 · AP

☐ A 12
☐ C 48

☐ B 3
☐ D 8
- 3 With **base ten materials**, 9 hundred-flats, 6 ten-rods and 2 unit-cubes are laid out. What number is that? B1.5 · KU

☐ A 17
☐ C 962

☐ B 152
☐ D 926
- 4 Is **73** an **even number** or an **odd number**? B1.1 · KU

☐ A even
☐ C neither

☐ B both
☐ D odd
- 5 A **digital clock** shows **5:20**. Where is the **minute hand** on an **analog clock** showing the same time? E2.6 · AP

☐ A pointing at the 20
☐ B pointing at the 5
☐ C pointing at the 7
☐ D pointing at the 4 on the clock face
- 6 Marigold builds a **house made of a cube with a triangular prism roof**. Which shapes did she use? E1.2 · AP

☐ A a cube and a triangular prism
☐ B two cubes and a rectangular prism
☐ C two cubes and a square pyramid
☐ D a cylinder and a cone
- 7 A border repeats: **■ ■ ▲ ■ ■ ▲ ■ ■ ▲**
 How many shapes are in the **pattern core**? C1.1 · KU

☐ A 9
☐ C 3

☐ B 6
☐ D 4
- 8 A **table of values** shows: **(1, 6) · (2, 11) · (3, 16)**
 What is the **term value** when the **position number** is **6**? C1.2 · AP

☐ A 36
☐ C 30

☐ B 31
☐ D 6
- 9 A bar graph is scaled so that **one square = 2 pots**. The green bar is **7 squares** tall. How many pots is that? D1.5 · AP

☐ A 14
☐ C 16

☐ B 2
☐ D 7

10 A tally table shows  | for red. How many people chose red? D1.2 · KU

☐ A 92

☐ B 7

☐ C 6

☐ D 5

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Week 7

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 Marigold pours 6 jars, each one quarter full. How many full jars of paint is that altogether? B2.7 · AP

☐ A $3/2$
☐ C 24

☐ B 2
☐ D 6
- 2 With base ten materials, 7 hundred-flats, 4 ten-rods and 1 unit-cubes are laid out. What number is that? B1.5 · KU

☐ A 714
☐ C 12

☐ B 741
☐ D 111
- 3 Is 140 an even number or an odd number? B1.1 · KU

☐ A both
☐ C neither

☐ B even
☐ D odd
- 4 Count backward by tens from 82. What is the fourth number you say? B1.4 · AP

☐ A 62
☐ C 52

☐ B 42
☐ D 72
- 5 Select every pair of shapes that must be congruent. E1.3 · TH
 Fill in every box that applies.

☐ A two triangles with the same base
☐ B the two ends of a cylinder
☐ C a square and a rectangle with the same perimeter
☐ D a cube face and a cube edge
☐ E two squares with 5 cm sides
- 6 An analog clock has the hour hand just past 8 and the minute hand on the 3. What would a digital clock show? E2.6 · AP

☐ A 3:08
☐ C 8:30

☐ B 8:03
☐ D 8:15
- 7 A table of values shows: $(1, 5) \cdot (2, 9) \cdot (3, 13)$
 What is the term value when the position number is 9? C1.2 · AP

☐ A 41
☐ C 36

☐ B 37
☐ D 9
- 8 What number goes in the box? $15 + \square = 28$ C2.1 · AP

☐ A 13
☐ C 43

☐ B 28
☐ D 15

- 9 Marigold wants to know which colour the whole school likes best. What should she do? D1.2 · TH
- ☐ A ask her three closest friends
 - ☐ B guess, because she knows the shop well
 - ☐ C pick the colour she sells the most of
 - ☐ D ask lots of people and record every answer in a tally table

10 A line plot of brushes per jar:

1 ••
4 •
5 •••

How many jars had 1 brushes? D1.3 · KU

- | | |
|---------------------------|---------------------------|
| ☐ A 3 | ☐ B 2 |
| ☐ C 1 | ☐ D 6 |

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Week 8

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 With **base ten materials**, 2 hundred-flats, 9 ten-rods and 9 unit-cubes are laid out. What number is that?

B1.5 · KU

- ☐ A 20
☐ C 119

- ☐ B 83
☐ D 299

- 2 Is 132 an **even number** or an **odd number**? B1.1 · KU

- ☐ A even
☐ C both

- ☐ B odd
☐ D neither

- 3 **Count backward** by tens from 53. What is the **fourth** number you say? B1.4 · AP

- ☐ A 43
☐ C 13

- ☐ B 23
☐ D 33

- 4 Marigold pours 4 jars, each **one half** full. How many **full** jars of paint is that altogether? B2.7 · AP

- ☐ A $4/3$
☐ C 4

- ☐ B 8
☐ D 2

- 5 What is true about the faces of a **cube**? E1.3 · AP

- ☐ A the faces come in three congruent pairs
☐ B none of the faces are congruent
☐ C the four triangular faces are congruent
☐ D all six faces are congruent squares

- 6 Select **every** pair of shapes that must be **congruent**. E1.3 · TH

Fill in every box that applies.

- ☐ A two squares with 5 cm sides
☐ B the two ends of a cylinder
☐ C a cube face and a cube edge
☐ D two triangles with the same base
☐ E a square and a rectangle with the same perimeter

- 7 What number goes in the box? $15 + \square = 32$ C2.1 · AP

- ☐ A 47
☐ C 32

- ☐ B 15
☐ D 17

- 8 A pattern: 600, 610, 620, 630, ... What comes next? C1.4 · AP

- ☐ A 620
☐ C 640

- ☐ B 730
☐ D 631

9 A line plot of brushes per jar:

1 ••
2 ••
3 •
4 •
5 •
6 •

How many jars had 1 brushes? D1.3 · KU

☐ A 8
☐ C 3

☐ B 1
☐ D 2

10 Brush sizes sold: 4, 13, 4, 4.

Are the **mean** and the **mode** the same? D2.2 · TH

☐ A no
☐ B yes
☐ C you cannot tell without more numbers
☐ D only if you sort them first

Weekly beats daily. Mark against the expectation code, not out of ten. A code missed twice is worth teaching; one miss is noise.

Week 9

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- Is **160** an even number or an odd number? (B1.1 · KU)
 - ☐ A odd
 - ☐ B even
 - ☐ C neither
 - ☐ D both
- On a **hundreds chart** you are on **72**. You move **two squares right**. What number are you on? (B1.4 · AP)
 - ☐ A 82
 - ☐ B 92
 - ☐ C 70
 - ☐ D 74
- Marigold pours **8 jars**, each **one quarter** full. How many **full jars** of paint is that altogether? (B2.7 · AP)
 - ☐ A 8
 - ☐ B 2
 - ☐ C 4
 - ☐ D 32
- With **base ten materials**, 9 hundred-flats, 0 ten-rods and 6 unit-cubes are laid out. What number is that? (B1.5 · KU)
 - ☐ A 960
 - ☐ B 15
 - ☐ C 96
 - ☐ D 906
- Which shape has **4 sides**? (E1.1 · KU)
 - ☐ A triangle
 - ☐ B square
 - ☐ C pentagon
 - ☐ D hexagon
- What is true about the faces of a **square pyramid**? (E1.3 · AP)
 - ☐ A none of the faces are congruent
 - ☐ B all six faces are congruent squares
 - ☐ C the four triangular faces are congruent
 - ☐ D the faces come in three congruent pairs
- Counting **backward: 850, 800, 750, 700, ...** What comes next? (C1.4 · AP)
 - ☐ A 600
 - ☐ B 650
 - ☐ C 699
 - ☐ D 750
- A border repeats: **• ▲ ▲ ■ • ▲ ▲ ■ • ▲ ▲ ■**
How many shapes are in the **pattern core**? (C1.1 · KU)
 - ☐ A 4
 - ☐ B 5
 - ☐ C 12
 - ☐ D 8
- Brush sizes sold: **2, 2, 6, 2**.
Are the **mean** and the **mode** the same? (D2.2 · TH)
 - ☐ A no
 - ☐ B you cannot tell without more numbers
 - ☐ C only if you sort them first
 - ☐ D yes

- 10 On a graph where **one square = 2 pots**, red is 3 squares and blue is 5 squares. How many **more** pots is the taller one? D1.5 · TH
- ☐ A 2

☐ B 4
- ☐ C 10

☐ D 16

Weekly beats daily. Mark against the expectation code, not out of ten. A code missed twice is worth teaching; one miss is noise.

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Week 10

Ten questions, mixed the way the real assessment is mixed – four Number, two Spatial Sense, two Algebra, two Data.

One week at a time. Ten questions is about fifteen minutes, which is the point – short enough that it actually happens.

- 1 Count backward by tens from 96. What is the fourth number you say? B1.4 · AP

☐ A 56
☐ C 86

☐ B 66
☐ D 76
- 2 Marigold pours 6 jars, each one quarter full. How many full jars of paint is that altogether? B2.7 · AP

☐ A 2
☐ C 6

☐ B $\frac{3}{2}$
☐ D 24
- 3 With base ten materials, 2 hundred-flats, 2 ten-rods and 5 unit-cubes are laid out. What number is that? B1.5 · KU

☐ A 45
☐ C 252

☐ B 9
☐ D 225
- 4 Is 188 an even number or an odd number? B1.1 · KU

☐ A odd
☐ C both

☐ B even
☐ D neither
- 5 Marigold builds a tower made of two cubes and a square pyramid on top. Which shapes did she use? E1.2 · AP

☐ A two cubes and a square pyramid
☐ B a cylinder and a cone
☐ C two cubes and a rectangular prism
☐ D a cube and a triangular prism
- 6 Which shape has 3 sides? E1.1 · KU

☐ A pentagon
☐ C rectangle

☐ B square
☐ D triangle
- 7 A border repeats: ● ▲ ▲ ■ ● ▲ ▲ ■ ● ▲ ▲ ■
How many shapes are in the pattern core? C1.1 · KU

☐ A 12
☐ C 8

☐ B 5
☐ D 4
- 8 A table of values shows: (1, 8) · (2, 13) · (3, 18)
What is the term value when the position number is 6? C1.2 · AP

☐ A 30
☐ C 38

☐ B 6
☐ D 33
- 9 A bar graph is scaled so that one square = 2 pots. The blue bar is 8 squares tall. How many pots is that? D1.5 · AP

☐ A 8
☐ C 18

☐ B 2
☐ D 16

10 A frequency table of favourite colours: red = 8 · blue = 7 · green = 6 · yellow = 3.

How many people were asked altogether? D1.2 · AP

☐ A 21

☐ B 8

☐ C 4

☐ D 24

Weekly beats daily. Mark against the expectation code, not out of ten. A code missed twice is worth teaching; one miss is noise.

Answers

For checking your own work after you finish. Every answer says *why* – read that part even when you got it right.

Sheet 3

- 1 C – 4 [B2.7] · 8 lots of one half = $8 \div 2 = 4$ full jars. Try it with real cups of water – two halves make one whole.
- 2 B – 2 [B2.7] · 4 lots of one half = $4 \div 2 = 2$ full jars. Try it with real cups of water – two halves make one whole.
- 3 D – 2 [B2.7] · 8 lots of one quarter = $8 \div 4 = 2$ full jars. Try it with real cups of water – two halves make one whole.
- 4 C – 4 [B2.7] · 8 lots of one half = $8 \div 2 = 4$ full jars. Try it with real cups of water – two halves make one whole.
- 5 A – 4 [B2.7] · 8 lots of one half = $8 \div 2 = 4$ full jars. Try it with real cups of water – two halves make one whole.
- 6 A – 5 [B2.7] · 10 lots of one half = $10 \div 2 = 5$ full jars. Try it with real cups of water – two halves make one whole.
- 7 B – 2 [B2.7] · 6 lots of one third = $6 \div 3 = 2$ full jars. Try it with real cups of water – two halves make one whole.
- 8 B – $4/3$ [B2.7] · 4 lots of one third = $4 \div 3 = 4/3$ full jars. Try it with real cups of water – two halves make one whole.
- 9 A – 4 [B2.7] · 8 lots of one half = $8 \div 2 = 4$ full jars. Try it with real cups of water – two halves make one whole.
- 10 A – 3 [B2.7] · 6 lots of one half = $6 \div 2 = 3$ full jars. Try it with real cups of water – two halves make one whole.
- 11 D – 6 [B2.7] · 12 lots of one half = $12 \div 2 = 6$ full jars. Try it with real cups of water – two halves make one whole.
- 12 B – 3 [B2.7] · 6 lots of one half = $6 \div 2 = 3$ full jars. Try it with real cups of water – two halves make one whole.

Sheet 4

- 1 D – 800 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.
- 2 D – 600 [C1.4] · Counting backward by 50. A pattern that goes down is still a pattern with a rule.
- 3 D – 600 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.
- 4 A – 80 [C1.4] · Each number is double the one before. Doubling grows much faster than adding – notice how quickly it climbs.
- 5 A – 800 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.
- 6 C – 350 [C1.4] · Counting backward by 50. A pattern that goes down is still a pattern with a rule.
- 7 D – 500 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.
- 8 B – 250 [C1.4] · Counting backward by 100. A pattern that goes down is still a pattern with a rule.
- 9 A – 180 [C1.4] · Only the tens digit is changing. Adding 10 leaves the hundreds and ones alone – until the tens roll over.
- 10 C – 470 [C1.4] · Only the tens digit is changing. Adding 10 leaves the hundreds and ones alone – until the tens roll over.
- 11 C – 500 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.
- 12 B – 500 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.

Sheet 5

- 1 D – 8 [C2.1] · Ask: 11 and what makes 19? Count on from 11, or take 11 away from 19. Either way the box is 8.
- 2 A – 5 [C2.1] · Ask: 3 and what makes 8? Count on from 3, or take 3 away from 8. Either way the box is 5.
- 3 D – 6 [C2.1] · The same shape always means the same number. Two triangles means $3 + 3 = 6$.
- 4 A – 10 [C2.1] · The same shape always means the same number. Two triangles means $5 + 5 = 10$.
- 5 C – a number we do not know yet [C2.1] · A box, a letter or a shape can all stand in for a number we have not worked out yet. That stand-in is called a **variable**.
- 6 D – 16 [C2.1] · The same shape always means the same number. Two triangles means $8 + 8 = 16$.
- 7 D – 20 [C2.1] · Ask: 13 and what makes 33? Count on from 13, or take 13 away from 33. Either way the box is 20.
- 8 C – 13 [C2.1] · Ask: 10 and what makes 23? Count on from 10, or take 10 away from 23. Either way the box is 13.
- 9 D – 16 [C2.1] · Ask: 5 and what makes 21? Count on from 5, or take 5 away from 21. Either way the box is 16.
- 10 A – 18 [C2.1] · The same shape always means the same number. Two triangles means $9 + 9 = 18$.
- 11 B – 5 [C2.1] · Ask: 8 and what makes 13? Count on from 8, or take 8 away from 13. Either way the box is 5.
- 12 D – a number we do not know yet [C2.1] · A box, a letter or a shape can all stand in for a number we have not worked out yet. That stand-in is called a **variable**.

Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.

Answers, continued

Sheet 6

- 1 C — ask lots of people and record every answer in a tally table [D1.2] · Asking lots of people and recording every answer is called a survey. Asking only friends gives you your friends' answer, not the school's.
- 2 A — 5 [D1.2] · Tally marks are grouped in fives, with the fifth stroke laid across the other four. Count the groups of five first, then the singles.
- 3 B — 18 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.
- 4 C — 21 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.
- 5 B — 19 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.
- 6 B — 6 [D1.2] · Tally marks are grouped in fives, with the fifth stroke laid across the other four. Count the groups of five first, then the singles.
- 7 D — 9 [D1.2] · Tally marks are grouped in fives, with the fifth stroke laid across the other four. Count the groups of five first, then the singles.
- 8 D — ask lots of people and record every answer in a tally table [D1.2] · Asking lots of people and recording every answer is called a survey. Asking only friends gives you your friends' answer, not the school's.
- 9 B — 28 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.
- 10 C — ask lots of people and record every answer in a tally table [D1.2] · Asking lots of people and recording every answer is called a survey. Asking only friends gives you your friends' answer, not the school's.
- 11 D — 22 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.
- 12 D — 31 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.

Sheet 7

- 1 C — 30 [D1.5] · Always read the scale before the bars. 6 squares $\times$ 5 pots = 30 pots. Counting the squares as pots is the trap.
- 2 C — 10 [D1.5] · Two steps. Find the difference in squares (1), then multiply by the scale (10) to get 10 pots.
- 3 A — 4 [D1.5] · Always read the scale before the bars. 2 squares $\times$ 2 pots = 4 pots. Counting the squares as pots is the trap.
- 4 A — 10 [D1.5] · Two steps. Find the difference in squares (1), then multiply by the scale (10) to get 10 pots.
- 5 D — 15 [D1.5] · Two steps. Find the difference in squares (3), then multiply by the scale (5) to get 15 pots.
- 6 C — 8 [D1.5] · Always read the scale before the bars. 4 squares $\times$ 2 pots = 8 pots. Counting the squares as pots is the trap.
- 7 B — 8 [D1.5] · Always read the scale before the bars. 4 squares $\times$ 2 pots = 8 pots. Counting the squares as pots is the trap.
- 8 A — 6 [D1.5] · Always read the scale before the bars. 3 squares $\times$ 2 pots = 6 pots. Counting the squares as pots is the trap.
- 9 C — 6 [D1.5] · Two steps. Find the difference in squares (3), then multiply by the scale (2) to get 6 pots.
- 10 D — 30 [D1.5] · Always read the scale before the bars. 3 squares $\times$ 10 pots = 30 pots. Counting the squares as pots is the trap.
- 11 D — 2 [D1.5] · Two steps. Find the difference in squares (1), then multiply by the scale (2) to get 2 pots.
- 12 D — 8 [D1.5] · Always read the scale before the bars. 4 squares $\times$ 2 pots = 8 pots. Counting the squares as pots is the trap.

Sheet 8

- 1 C — yes [D2.2] · Mode = 8 (the one that turns up most). Mean = $32 \div 4 = 8$. They match because every number is the same.
- 2 B — no [D2.2] · Mode = 5 (the one that turns up most). Mean = $28 \div 4 = 7$. One odd number pulls the mean away from the mode.
- 3 B — no [D2.2] · Mode = 3 (the one that turns up most). Mean = $17 \div 4 = 4.25$. One odd number pulls the mean away from the mode.
- 4 A — no [D2.2] · Mode = 2 (the one that turns up most). Mean = $12 \div 4 = 3$. One odd number pulls the mean away from the mode.
- 5 A — yes [D2.2] · Mode = 6 (the one that turns up most). Mean = $24 \div 4 = 6$. They match because every number is the same.
- 6 A — no [D2.2] · Mode = 4 (the one that turns up most). Mean = $22 \div 4 = 5.5$. One odd number pulls the mean away from the mode.
- 7 D — yes [D2.2] · Mode = 4 (the one that turns up most). Mean = $16 \div 4 = 4$. They match because every number is the same.
- 8 D — no [D2.2] · Mode = 2 (the one that turns up most). Mean = $16 \div 4 = 4$. One odd number pulls the mean away from the mode.
- 9 D — no [D2.2] · Mode = 4 (the one that turns up most). Mean = $23 \div 4 = 5.75$. One odd number pulls the mean away from the mode.
- 10 B — yes [D2.2] · Mode = 5 (the one that turns up most). Mean = $20 \div 4 = 5$. They match because every number is the same.
- 11 B — yes [D2.2] · Mode = 7 (the one that turns up most). Mean = $28 \div 4 = 7$. They match because every number is the same.
- 12 A — yes [D2.2] · Mode = 6 (the one that turns up most). Mean = $24 \div 4 = 6$. They match because every number is the same.

Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.

Answers, continued

Sheet 9

- 1 A — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 2 D — a cube and a triangular prism [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 3 D — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 4 C — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 5 A — two cubes and a square pyramid [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 6 A — two cubes and a rectangular prism [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 7 A — two cubes and a square pyramid [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 8 B — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 9 D — a cube and a triangular prism [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 10 A — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 11 B — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 12 D — a cylinder and a cone [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.

Sheet 10

- 1 C — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 2 C — the four triangular faces are congruent [E1.3] · Congruent faces are the ones that match exactly. Check by holding a real box and looking at opposite sides.
- 3 C — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 4 B — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 5 A — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 6 D — another square with 5 cm sides [E1.3] · Congruent means identical in size and shape. Only another 5 cm square fits exactly on top.
- 7 A — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 8 C — the faces come in three congruent pairs [E1.3] · Congruent faces are the ones that match exactly. Check by holding a real box and looking at opposite sides.
- 9 A — another square with 7 cm sides [E1.3] · Congruent means identical in size and shape. Only another 7 cm square fits exactly on top.
- 10 B — another square with 3 cm sides [E1.3] · Congruent means identical in size and shape. Only another 3 cm square fits exactly on top.
- 11 D — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 12 A — another square with 7 cm sides [E1.3] · Congruent means identical in size and shape. Only another 7 cm square fits exactly on top.

Sheet 11

- 1 D — pointing at the 5 on the clock face [E2.6] · Each number on the face is 5 minutes. $25 \text{ minutes} \div 5 = 5$, so the minute hand points there. The hour hand points near the 10.
- 2 D — 2:45 [E2.6] · Multiply the minute-hand number by 5. $9 \times 5 = 45$ minutes. So the time is 2:45 — quarter to.

- 3 A — pointing at the 11 on the clock face [E2.6] · Each number on the face is 5 minutes. $55 \text{ minutes} \div 5 = 11$, so the minute hand points there. The hour hand points near the 9.
- 4 A — 5:45 [E2.6] · Multiply the minute-hand number by 5. $9 \times 5 = 45$ minutes. So the time is 5:45 — quarter to.
- 5 C — 9:00 [E2.6] · Multiply the minute-hand number by 5. $12 \times 5 = 0$ minutes. So the time is 9:00 — o'clock.
- 6 C — 7:45 [E2.6] · Multiply the minute-hand number by 5. $9 \times 5 = 45$ minutes. So the time is 7:45 — quarter to.
- 7 D — pointing at the 3 on the clock face [E2.6] · Each number on the face is 5 minutes. $15 \text{ minutes} \div 5 = 3$, so the minute hand points there. The hour hand points near the 6.
- 8 D — 10:15 [E2.6] · Multiply the minute-hand number by 5. $3 \times 5 = 15$ minutes. So the time is 10:15 — quarter past.
- 9 B — 9:30 [E2.6] · Multiply the minute-hand number by 5. $6 \times 5 = 30$ minutes. So the time is 9:30 — half past.
- 10 D — 8:00 [E2.6] · Multiply the minute-hand number by 5. $12 \times 5 = 0$ minutes. So the time is 8:00 — o'clock.
- 11 A — pointing at the 6 on the clock face [E2.6] · Each number on the face is 5 minutes. $30 \text{ minutes} \div 5 = 6$, so the minute hand points there. The hour hand points near the 8.
- 12 C — 4:15 [E2.6] · Multiply the minute-hand number by 5. $3 \times 5 = 15$ minutes. So the time is 4:15 — quarter past.
-

Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.

Answers, continued

Sheet 12

- 1 B — 16 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 3.
- 2 C — 39 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 4.
- 3 B — 42 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 5.
- 4 A — 20 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 2.
- 5 B — 16 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 3.
- 6 C — 38 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 4.
- 7 A — 36 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 5.
- 8 D — 25 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 3.
- 9 C — 37 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 4.
- 10 D — 18 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 2.
- 11 C — 28 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 3.
- 12 B — 22 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 2.

Sheet 13

- 1 B — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 2 row — there are 2. The number on the left is the value, not the count.
- 2 B — 3 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 3 row — there are 3. The number on the left is the value, not the count.
- 3 C — 1 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 2 row — there are 1. The number on the left is the value, not the count.
- 4 A — 1 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 4 row — there are 1. The number on the left is the value, not the count.
- 5 B — 3 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 4 row — there are 3. The number on the left is the value, not the count.
- 6 C — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 4 row — there are 2. The number on the left is the value, not the count.
- 7 C — 4 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 1 row — there are 4. The number on the left is the value, not the count.
- 8 D — 1 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 6 row — there are 1. The number on the left is the value, not the count.
- 9 B — 4 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 6 row — there are 4. The number on the left is the value, not the count.
- 10 D — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 5 row — there are 2. The number on the left is the value, not the count.
- 11 B — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 6 row — there are 2. The number on the left is the value, not the count.
- 12 C — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 3 row — there are 2. The number on the left is the value, not the count.

Sheet 14

- 1 A — 54 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.

- 2 B — 82 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 3 C — 77 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 4 B — 47 [B1.4] · Each square right is one more. Each square down is ten more.
- 5 C — 29 [B1.4] · 59, 49, 39, 29 — the fourth number you say is 29. Counting backward is the same skill in reverse.
- 6 A — 24 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 7 C — 50 [B1.4] · Each square right is one more. Each square down is ten more.
- 8 A — 55 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 9 C — 78 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 10 C — 75 [B1.4] · Each square right is one more. Each square down is ten more.
- 11 D — 68 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 12 C — 33 [B1.4] · 63, 53, 43, 33 — the fourth number you say is 33. Counting backward is the same skill in reverse.
- =====

Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.

Answers, continued

Sheet 15

- 1 D — 8 [E1.1] · A octagon has 8 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 2 B — octagon [E1.1] · A octagon has 8 sides. Pentagon 5, hexagon 6, octagon 8 — the name tells you the number.
- 3 B — 8 [E1.1] · A octagon has 8 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 4 A — 4 [E1.1] · A square has 4 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 5 A — rectangle [E1.1] · A rectangle has 4 sides. So does a square — both are correct names for a 4-sided shape, which is why the question names one.
- 6 A — square [E1.1] · A square has 4 sides. So does a rectangle — both are correct names for a 4-sided shape, which is why the question names one.
- 7 D — 3 [E1.1] · A triangle has 3 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 8 C — 6 [E1.1] · A hexagon has 6 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 9 B — 3 [E1.1] · A triangle has 3 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 10 C — 5 [E1.1] · A pentagon has 5 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 11 D — 3 [E1.1] · A triangle has 3 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 12 A — octagon [E1.1] · A octagon has 8 sides. Pentagon 5, hexagon 6, octagon 8 — the name tells you the number.

Sheet 16

- 1 A — even [B1.1] · Look only at the last digit. 8 is even, so 138 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 2 A — odd [B1.1] · Look only at the last digit. 1 is odd, so 191 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 3 D — odd [B1.1] · Look only at the last digit. 9 is odd, so 119 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 4 A — odd [B1.1] · Look only at the last digit. 5 is odd, so 35 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 5 D — odd [B1.1] · Look only at the last digit. 5 is odd, so 165 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 6 B — even [B1.1] · Look only at the last digit. 4 is even, so 154 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 7 C — even [B1.1] · Look only at the last digit. 8 is even, so 98 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 8 C — even [B1.1] · Look only at the last digit. 4 is even, so 44 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 9 D — odd [B1.1] · Look only at the last digit. 5 is odd, so 105 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 10 B — odd [B1.1] · Look only at the last digit. 9 is odd, so 159 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 11 A — even [B1.1] · Look only at the last digit. 6 is even, so 26 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 12 A — even [B1.1] · Look only at the last digit. 4 is even, so 74 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.

Sheet 17

- 1 A — $300 + 90 + 2$ [B1.5] · Expanded form shows what each digit is worth: 3 hundreds, 9 tens and 2 ones. A zero digit is simply left out.
- 2 C — $100 + 9$ [B1.5] · Expanded form shows what each digit is worth: 1 hundreds, 0 tens and 9 ones. A zero digit is simply left out.
- 3 D — $100 + 60 + 6$ [B1.5] · Expanded form shows what each digit is worth: 1 hundreds, 6 tens and 6 ones. A zero digit is simply left out.
- 4 B — $600 + 80 + 7$ [B1.5] · Expanded form shows what each digit is worth: 6 hundreds, 8 tens and 7 ones. A zero digit is simply left out.
- 5 C — 338 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $3 \times 100 + 3 \times 10 + 8 \times 1 = 338$. That is also its **expanded form**.
- 6 A — $800 + 3$ [B1.5] · Expanded form shows what each digit is worth: 8 hundreds, 0 tens and 3 ones. A zero digit is simply left out.
- 7 D — $100 + 20 + 8$ [B1.5] · Expanded form shows what each digit is worth: 1 hundreds, 2 tens and 8 ones. A zero digit is simply left out.
- 8 A — $300 + 30 + 9$ [B1.5] · Expanded form shows what each digit is worth: 3 hundreds, 3 tens and 9 ones. A zero digit is simply left out.
- 9 D — 827 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $8 \times 100 + 2 \times 10 + 7 \times 1 = 827$. That is also its **expanded form**.

10 D — $800 + 50 + 7$ [B1.5] · Expanded form shows what each digit is worth: 8 hundreds, 5 tens and 7 ones. A zero digit is simply left out.

11 A — $800 + 80 + 8$ [B1.5] · Expanded form shows what each digit is worth: 8 hundreds, 8 tens and 8 ones. A zero digit is simply left out.

12 A — 695 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $6 \times 100 + 9 \times 10 + 5 \times 1 = 695$. That is also its **expanded form**.

Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.

Answers, continued

Sheet 18

- 1 B — 2 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ▲ ●, which is 2 shapes. Some people call it the repeating unit.
- 2 B — 3 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ■ ▲ ▲, which is 3 shapes. Some people call it the repeating unit.
- 3 D — 4 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ● ▲ ▲ ■, which is 4 shapes. Some people call it the repeating unit.
- 4 C — 4 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ● ▲ ▲ ■, which is 4 shapes. Some people call it the repeating unit.
- 5 C — 3 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ★ ● ★, which is 3 shapes. Some people call it the repeating unit.
- 6 D — 3 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ■ ■ ▲, which is 3 shapes. Some people call it the repeating unit.
- 7 B — 4 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ● ▲ ▲ ■, which is 4 shapes. Some people call it the repeating unit.
- 8 B — 2 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ▲ ●, which is 2 shapes. Some people call it the repeating unit.
- 9 C — 3 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ■ ■ ▲, which is 3 shapes. Some people call it the repeating unit.
- 10 A — 3 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ★ ● ★, which is 3 shapes. Some people call it the repeating unit.
- 11 D — 2 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ▲ ●, which is 2 shapes. Some people call it the repeating unit.
- 12 B — 2 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ▲ ●, which is 2 shapes. Some people call it the repeating unit.

Sheet 19

- 1 B and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 2 A and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 3 C and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 4 C and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 5 A and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 6 A and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 7 A and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 8 C and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 9 B and C — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 10 C and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 11 B and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 12 A and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.

Sheet 20

- 1 B — even [B1.1] · Look only at the last digit. 6 is even, so 176 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 2 D — 37 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 3 B — 1 [B2.7] · 4 lots of one quarter = $4 \div 4 = 1$ full jars. Try it with real cups of water — two halves make one whole.
- 4 C — $700 + 90 + 6$ [B1.5] · Expanded form shows what each digit is worth: 7 hundreds, 9 tens and 6 ones. A zero digit is simply left out.

- 5 A — pointing at the 7 on the clock face [E2.6] · Each number on the face is 5 minutes. $35 \text{ minutes} \div 5 = 7$, so the minute hand points there. The hour hand points near the 1.
- 6 C — two cubes and a square pyramid [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 7 D — 800 [C1.4] · Adding 100 changes only the hundreds digit. Say the numbers out loud and you can hear the pattern.
- 8 B — 2 [C1.1] · The pattern core is the smallest bit that starts over — here it is ▲ ●, which is 2 shapes. Some people call it the repeating unit.
- 9 B — no [D2.2] · Mode = 4 (the one that turns up most). Mean = $23 \div 4 = 5.75$. One odd number pulls the mean away from the mode.
- 10 B — 0 [D1.5] · Two steps. Find the difference in squares (0), then multiply by the scale (2) to get 0 pots.
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Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.

Answers, continued

Sheet 21

- 1 C — 33 [B1.4] · 63, 53, 43, 33 — the fourth number you say is 33. Counting backward is the same skill in reverse.
- 2 C — $10/3$ [B2.7] · 10 lots of one third = $10 \div 3 = 10/3$ full jars. Try it with real cups of water — two halves make one whole.
- 3 C — $800 + 90 + 4$ [B1.5] · Expanded form shows what each digit is worth: 8 hundreds, 9 tens and 4 ones. A zero digit is simply left out.
- 4 A — even [B1.1] · Look only at the last digit. 8 is even, so 88 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 5 A and D — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 6 A — pointing at the 9 on the clock face [E2.6] · Each number on the face is 5 minutes. $45 \text{ minutes} \div 5 = 9$, so the minute hand points there. The hour hand points near the 10.
- 7 A — 2 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is $\blacktriangle \bullet$, which is 2 shapes. Some people call it the repeating unit.
- 8 A — 19 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 2.
- 9 C — 0 [D1.5] · Two steps. Find the difference in squares (0), then multiply by the scale (10) to get 0 pots.
- 10 D — 23 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.

Sheet 22

- 1 B — 3 [B2.7] · 12 lots of one quarter = $12 \div 4 = 3$ full jars. Try it with real cups of water — two halves make one whole.
- 2 D — $600 + 80 + 1$ [B1.5] · Expanded form shows what each digit is worth: 6 hundreds, 8 tens and 1 ones. A zero digit is simply left out.
- 3 C — odd [B1.1] · Look only at the last digit. 1 is odd, so 71 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 4 A — 87 [B1.4] · 117, 107, 97, 87 — the fourth number you say is 87. Counting backward is the same skill in reverse.
- 5 D — another square with 5 cm sides [E1.3] · Congruent means identical in size and shape. Only another 5 cm square fits exactly on top.
- 6 A and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 7 B — 28 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 3.
- 8 D — 6 [C2.1] · The same shape always means the same number. Two triangles means $3 + 3 = 6$.
- 9 C — 9 [D1.2] · Tally marks are grouped in fives, with the fifth stroke laid across the other four. Count the groups of five first, then the singles.
- 10 D — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 3 row — there are 2. The number on the left is the value, not the count.

Sheet 23

- 1 A — 850 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $8 \times 100 + 5 \times 10 + 0 \times 1 = 850$. That is also its **expanded form**.
- 2 B — even [B1.1] · Look only at the last digit. 4 is even, so 134 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 3 A — 68 [B1.4] · 98, 88, 78, 68 — the fourth number you say is 68. Counting backward is the same skill in reverse.
- 4 D — 2 [B2.7] · 8 lots of one quarter = $8 \div 4 = 2$ full jars. Try it with real cups of water — two halves make one whole.
- 5 B — square [E1.1] · A square has 4 sides. So does a rectangle — both are correct names for a 4-sided shape, which is why the question names one.
- 6 C — they are exactly the same size and the same shape [E1.3] · Congruent means you could lay one exactly on top of the other and it would fit — no stretching, no shrinking. Turning or flipping it is allowed.
- 7 A — 8 [C2.1] · The same shape always means the same number. Two triangles means $4 + 4 = 8$.
- 8 C — 80 [C1.4] · Each number is double the one before. Doubling grows much faster than adding — notice how quickly it climbs.
- 9 C — 1 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 6 row — there are 1. The number on the left is the value, not the count.
- 10 C — yes [D2.2] · Mode = 9 (the one that turns up most). Mean = $36 \div 4 = 9$. They match because every number is the same.

Sheet 24

- 1 A — even [B1.1] · Look only at the last digit. 0 is even, so 90 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 2 C — 75 [B1.4] · 105, 95, 85, 75 — the fourth number you say is 75. Counting backward is the same skill in reverse.

- 3 D — 2 [B2.7] · 6 lots of one third = $6 \div 3 = 2$ full jars. Try it with real cups of water — two halves make one whole.
- 4 B — $200 + 20 + 7$ [B1.5] · Expanded form shows what each digit is worth: 2 hundreds, 2 tens and 7 ones. A zero digit is simply left out.
- 5 A — **two cubes and a square pyramid** [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 6 B — 5 [E1.1] · A pentagon has 5 sides. Pentagon 5, hexagon 6, octagon 8 — the names come from the number.
- 7 D — **48** [C1.4] · Each number is double the one before. Doubling grows much faster than adding — notice how quickly it climbs.
- 8 B — 2 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is **▲ ●**, which is 2 shapes. Some people call it the repeating unit.
- 9 A — no [D2.2] · Mode = 3 (the one that turns up most). Mean = $22 \div 4 = 5.5$. One odd number pulls the mean away from the mode.
- 10 A — 25 [D1.5] · Two steps. Find the difference in squares (5), then multiply by the scale (5) to get 25 pots.
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Answers, continued

Sheet 25

- 1 C — 71 [B1.4] · A hundreds chart has ten numbers in each row, so one square down adds 10. One square right adds 1.
- 2 B — 3 [B2.7] · 12 lots of one quarter = $12 \div 4 = 3$ full jars. Try it with real cups of water — two halves make one whole.
- 3 C — 962 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $9 \times 100 + 6 \times 10 + 2 \times 1 = 962$. That is also its **expanded form**.
- 4 D — odd [B1.1] · Look only at the last digit. 3 is odd, so 73 is odd. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 5 D — pointing at the 4 on the clock face [E2.6] · Each number on the face is 5 minutes. 20 minutes $\div 5 = 4$, so the minute hand points there. The hour hand points near the 5.
- 6 A — a cube and a triangular prism [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 7 C — 3 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ■ ■ ▲, which is 3 shapes. Some people call it the repeating unit.
- 8 B — 31 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 5.
- 9 A — 14 [D1.5] · Always read the scale before the bars. 7 squares $\times$ 2 pots = 14 pots. Counting the squares as pots is the trap.
- 10 C — 6 [D1.2] · Tally marks are grouped in fives, with the fifth stroke laid across the other four. Count the groups of five first, then the singles.

Sheet 26

- 1 A — $3/2$ [B2.7] · 6 lots of one quarter = $6 \div 4 = 3/2$ full jars. Try it with real cups of water — two halves make one whole.
- 2 B — 741 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $7 \times 100 + 4 \times 10 + 1 \times 1 = 741$. That is also its **expanded form**.
- 3 B — even [B1.1] · Look only at the last digit. 0 is even, so 140 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 4 C — 52 [B1.4] · 82, 72, 62, 52 — the fourth number you say is 52. Counting backward is the same skill in reverse.
- 5 B and E — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 6 D — 8:15 [E2.6] · Multiply the minute-hand number by 5. $3 \times 5 = 15$ minutes. So the time is 8:15 — quarter past.
- 7 B — 37 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 4.
- 8 A — 13 [C2.1] · Ask: 15 and what makes 28? Count on from 15, or take 15 away from 28. Either way the box is 13.
- 9 D — ask lots of people and record every answer in a tally table [D1.2] · Asking lots of people and recording every answer is called a **survey**. Asking only friends gives you your friends' answer, not the school's.
- 10 B — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 1 row — there are 2. The number on the left is the value, not the count.

Sheet 27

- 1 D — 299 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $2 \times 100 + 9 \times 10 + 9 \times 1 = 299$. That is also its **expanded form**.
- 2 A — even [B1.1] · Look only at the last digit. 2 is even, so 132 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 3 B — 23 [B1.4] · 53, 43, 33, 23 — the fourth number you say is 23. Counting backward is the same skill in reverse.
- 4 D — 2 [B2.7] · 4 lots of one half = $4 \div 2 = 2$ full jars. Try it with real cups of water — two halves make one whole.
- 5 D — all six faces are congruent squares [E1.3] · Congruent faces are the ones that match exactly. Check by holding a real box and looking at opposite sides.
- 6 A and B — two squares with 5 cm sides, the two ends of a cylinder [E1.3] · Congruent means exactly the same size AND shape. Same perimeter is not enough, and same base is not enough. More than one answer is right here.
- 7 D — 17 [C2.1] · Ask: 15 and what makes 32? Count on from 15, or take 15 away from 32. Either way the box is 17.
- 8 C — 640 [C1.4] · Only the tens digit is changing. Adding 10 leaves the hundreds and ones alone — until the tens roll over.
- 9 D — 2 [D1.3] · A line plot stacks one dot for each thing counted. Count the dots in the 1 row — there are 2. The number on the left is the value, not the count.
- 10 A — no [D2.2] · Mode = 4 (the one that turns up most). Mean = $25 \div 4 = 6.25$. One odd number pulls the mean away from the mode.

Sheet 28

- 1 B — even [B1.1] · Look only at the last digit. 0 is even, so 160 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.

- 2 D — 74 [B1.4] · Each square right is one more. Each square down is ten more.
- 3 B — 2 [B2.7] · 8 lots of one quarter = $8 \div 4 = 2$ full jars. Try it with real cups of water — two halves make one whole.
- 4 D — 906 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $9 \times 100 + 0 \times 10 + 6 \times 1 = 906$. That is also its **expanded form**.
- 5 B — square [E1.1] · A square has 4 sides. So does a rectangle — both are correct names for a 4-sided shape, which is why the question names one.
- 6 C — the four triangular faces are congruent [E1.3] · Congruent faces are the ones that match exactly. Check by holding a real box and looking at opposite sides.
- 7 B — 650 [C1.4] · Counting backward by 50. A pattern that goes down is still a pattern with a rule.
- 8 A — 4 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ● ▲ ▲ ■, which is 4 shapes. Some people call it the repeating unit.
- 9 A — no [D2.2] · Mode = 2 (the one that turns up most). Mean = $12 \div 4 = 3$. One odd number pulls the mean away from the mode.
- 10 B — 4 [D1.5] · Two steps. Find the difference in squares (2), then multiply by the scale (2) to get 4 pots.
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Answers, continued

Sheet 29

- 1 B — 66 [B1.4] · 96, 86, 76, 66 — the fourth number you say is 66. Counting backward is the same skill in reverse.
- 2 B — $3/2$ [B2.7] · 6 lots of one quarter = $6 \div 4 = 3/2$ full jars. Try it with real cups of water — two halves make one whole.
- 3 D — 225 [B1.5] · A flat is 100, a rod is 10, a cube is 1. $2 \times 100 + 2 \times 10 + 5 \times 1 = 225$. That is also its **expanded form**.
- 4 B — even [B1.1] · Look only at the last digit. 8 is even, so 188 is even. Even numbers can be shared into two equal groups; odd ones always have one left over.
- 5 A — two cubes and a square pyramid [E1.2] · Take the structure apart in your head, one solid at a time. Building it with real boxes and tins makes this much easier than looking at a picture.
- 6 D — triangle [E1.1] · A triangle has 3 sides. Pentagon 5, hexagon 6, octagon 8 — the name tells you the number.
- 7 D — 4 [C1.1] · The **pattern core** is the smallest bit that starts over — here it is ● ▲ ▲ ■, which is 4 shapes. Some people call it the repeating unit.
- 8 D — 33 [C1.2] · The first number in each pair is the **position number** (also called the term number). The second is the **term value**. Each time the position goes up 1, the value goes up 5.
- 9 D — 16 [D1.5] · Always read the scale before the bars. 8 squares $\times$ 2 pots = 16 pots. Counting the squares as pots is the trap.
- 10 D — 24 [D1.2] · The word **frequency** just means how many times something turned up. Add every frequency to get the total asked.

Generated, not typed. Every answer was computed by the same code that printed the question, so the key cannot drift.