



UK Answers**Blue****Challenge Cards**

1. Decreasing pattern
 $21\text{km} + 18 + 15 + 12$
 $+ 9 + 6 =$
 81 km in 6 days
2. 3 possible combinations
 - 3 sticks, 4 balls, 4 shin
 $[\pounds60 + \pounds12 + \pounds28 = \pounds100]$
 - 3 sticks, 11 balls, 1 shin
 $[\pounds60 + \pounds33 + \pounds7 = \pounds100]$
 - 4 sticks, 2 balls, 2 shin
 $[\pounds80 + \pounds6 + \pounds14 = \pounds100]$
3. Main set
 $0.4 + 0.75 + 0.3 = 1.6\text{km}$
 Therefore $1.6 \times 2 =$
 3.2 km in total
 $1\text{km} \div 25\text{m} = 40$ laps
 $\Rightarrow 3.2 \times 40$ laps = 128 laps
4. 150 non-runners
 80 missed it with notes
 $150 - 80$ [notes] = 70 walked
 150 runners
 $1:5$ sprinted $\Rightarrow 30$ sprinted
 $150 - 30 = 120$ jogged
5. Process of elimination
 Mystery number is 46
6. "Guess & revise" or algebra
 $x =$ animal [2 legs]
 x [chicken] + $2x$ [sheep] = 42
 $3x = 42$, so $x = 14$ animals
 Therefore
 7 chickens & 7 sheep
 Legs: $14 + 28 = 42$

7. Set up a costs list
 [10 items \rightarrow $\pounds425$]

Helmets	Shorts	Total
1	9	$\pounds375$
2	8	$\pounds400$
3	7	$\pounds425$
8. $8:00 - 7:00\text{am} = 1$ hour
 Breakfast $_ = 20$ minutes
 Left over $\Rightarrow 40$ minutes
 Hair = 15 minutes
 Teeth = 5 minutes
 Pack bag = 10 minutes
 Make lunch = 10 minutes
9. Work in reverse
 - a. $(26 \div 2) - 5 = 8$
 - b. $((12 \times 2) - 4) \times 2 = 40$
 - c. $(54 \div 6) - 6 = 3$
10. Arithmetic reasoning
 76 marbles
 $76 \div 5 = 13 \text{ r } 1$
 $76 \div 6 = 12 \text{ r } 4$
 $76 \div 4 = 19$
11. Set up a costs table
Answer
 $2 \times \pounds5$ [4WD] = $\pounds10$
 $7 \times \pounds3$ [sedan] = $\pounds21$
12. $38 \times 13\frac{1}{2} = 513$ minutes
 riding time
 6 breaks $\times 7 = 42$ minutes
 Total = 555 minutes
 $\Rightarrow 9$ hours & 15 minutes
Answer
 Time finished = 7:15pm

UK Answers**Blue****Challenge Cards**

13. Apples
 $£7.20 \div 60p = 12$ items
 $18 - 12 = 6$ oranges
 Oranges
 $£1.80 \div 6 = 30p$ each
14. Ratio is 12 emus : 1 dog
 Legs $\Rightarrow 24 + 4 = 28$
 $140 \div 28 = 5$
 Therefore, increase 5 fold
 60 emus : 5 dogs
 Legs = $120 + 20 = 140$
Answer = 5 dogs
15. Arithmetic reasoning
 $\Omega = 1$  = 6
 $\text{€} = 2$  = 7
 $\Omega = 3$ candle = 8
 $\infty = 4$ $\infty = 9$
 $\rightarrow = 5$
16. $1/4 + 7/20 + 3/10 = 18/20$
 White paper $20/20 - 18/20$
 $= 2/20 \Rightarrow 1/10$
Answer
 $1/10$ of £50 = £5
17. Ratio is 5 red : 4 white
- a. $45 \text{ red} \div 5 \text{ red} = 9$ 'sets'
 Therefore $4 \times 9 = 36$
 $\Rightarrow 45 \text{ red} : 36 \text{ white}$
- b. Pattern has 9 tiles overall
 $225 \div 9 = 25$
 Therefore $\times 25$ to both tiles
 $\Rightarrow 125 \text{ red} : 100 \text{ white}$

18. Create/use a calendar
 a. 6 joint work days in August:
 $1^{\text{st}}, 7^{\text{th}}, 13^{\text{th}}, 19^{\text{th}}, 25^{\text{th}}, 31^{\text{st}}$
- b. Total days: Dave 16 Matt 11
 \Rightarrow £100 more to Matt [5 x £20]
19. Work in reverse
 a. $(26 - 6) \div 5 = 4$
 b. $(\sqrt{16}) + 8 = 12$
 c. $((72 \div 6) - 2) \times 2 = 20$
20. Angela 9 & Tim 6
 15 items = $1/2$ of total
 Nikki = $6 [\text{Tim}] \div 2 \Rightarrow 3$
 Boys $\Rightarrow 15 - 3 = 12$
 Rupert 8 & Michael 4
Total $\Rightarrow 30$ items
21. Students to make a list
 Answer = $3P \times 2B \times 2R \Rightarrow$
 12 different combinations
22. Create "legs" table/list
- | <u>Spiders</u> | <u>Flies</u> | <u>Legs</u> |
|----------------|--------------|-------------|
| 1 [8] | 2 [12] | 20 |
- Want 100 legs = 20×5
 $\Rightarrow 5$ spiders [40 legs]
 10 flies [60 legs]
23. "Guess & revise"
- | | |
|----------|----|
| Dad | 36 |
| Mum | 35 |
| Son | 9 |
| Daughter | 7 |
- 24a. $9 \div 3 \times 5 = 15$
 b. $2 \times 10 - 7 = 13$
 c. $15 \div 3 + 6 = 11$
 d. $7 \times 6 \div 3 = 14$

UK Answers**Blue****Challenge Cards**

25. Create a table (add to 19)
- | <u>2 legs</u> | <u>4 legs</u> | <u>Total legs</u> |
|---------------|---------------|-------------------|
| 1 | 18 | 74 (high) |
| 5 | 14 | 66 (high) |
| 10 | 9 | 56 (high) |
| 13 | 6 | 50 |

Answer

13 two legged & 6 four legged

26. Until lunch
 $£176 \div £4 = 44$
 After lunch
 $44 \times 2 = 88$
 $88 \times £1.75 = £154$

Total

$\Rightarrow 132$ soaps for £330

27.

x	8	5	2	6
4	32	20	8	24
5	40	25	10	30
7	56	35	14	42

28. Students to make a list
 Answer = $2 \times 3 \times 3 \times 1$ items
 $\Rightarrow 12$ combinations of clothing

29. Chips
 2 sections = 48 packets
 1 section $\Rightarrow 24$ items
 Chocolate
 $3 \frac{1}{2} \times 24 = 84$
Overall
 $10 \times 24 = 240$ items

30. Parents
 $\frac{1}{4}$ each = $£1250 \times 2 = £2500$
 $\Rightarrow \frac{1}{2} = £5000$

Friends

$£5000 \div 10 = £500$ each

Gwyneth kept £2500

Total winnings $\Rightarrow £10,000$

31. Students to list/draw flags
 Answer = $3 \times 3 \times 3 \Rightarrow$
 27 possible flags

32. $15 + 9 + 25 + 20 + 15 =$
 84 books
 $84 \div 6 = 14$ per box

33. Last 3 dates

11 / 11 / 2001

11 / 11 / 1999

21 / 11 / 1991

Next 3 dates

11 / 11 / 2010

11 / 01 / 2011

01 / 11 / 2011

34. Round 1 $32 \div 2 = 16$ matches
 Round 2 $16 \div 2 = 8$ matches
 Round 3 $8 \div 2 = 4$ matches
 Round 4 $4 \div 2 = 2$ matches
 Round 5 $2 \div 2 = 1$ match
Total $\Rightarrow 31$ matches

35. $8 \times 3 \div 2 = 12$
 $5 \times 6 \div 3 = 8 \Rightarrow 10$

36. 7 people (including herself)
 $\times 6$ eggs (1 to each)
 $= 42$ Easter eggs

UK Answers**Blue****Challenge Cards**

$$\begin{array}{r}
 37a. \quad 4 \ 1 \ 3 \\
 \quad \quad 6 \ 2 \ 4 \\
 \quad \quad + \ 2 \ 9 \ 9 \\
 \quad \quad \hline
 \quad \quad 1 \ 3 \ 3 \ 6
 \end{array}$$

$$\begin{array}{r}
 b. \quad 6 \ 7 \ 2 \\
 \quad \quad 4 \ 9 \ 8 \\
 \quad \quad + \ 3 \ 4 \ 7 \\
 \quad \quad \hline
 \quad \quad 1 \ 5 \ 1 \ 7
 \end{array}$$

$$\begin{array}{r}
 38. \quad 1 \ 023 \ 456 \ 789 \\
 \quad \quad 1 \ 023 \ 456 \ 798 \\
 \quad \quad 1 \ 023 \ 456 \ 879
 \end{array}$$

One billion, twenty-three million, four hundred and fifty-six thousand, seven hundred and eighty-nine.

$$\begin{array}{l}
 39. \quad \text{Until lunch} \\
 \quad \quad \text{£}350 \div 5 = 70 \text{ cd's} \\
 \quad \quad \text{After lunch} \\
 \quad \quad 70 \times 2 \Rightarrow 140 \text{ cd's} \\
 \quad \quad 140 \times \text{£}3 = \text{£}420 \\
 \quad \quad \underline{\text{Total sales}} \\
 \quad \quad \text{£}350 + \text{£}420 = \\
 \quad \quad \text{£}770 \text{ for } 210 \text{ cd's}
 \end{array}$$

$$\begin{array}{l}
 40. \quad 9 \text{ queues} \times 7 \text{ people} \\
 \quad \quad = 63 \text{ ticket buyers}
 \end{array}$$

41. Arithmetic reasoning

$$\begin{array}{l}
 a. \quad \Phi = 12 \\
 \quad \quad \Omega = 3 \\
 \quad \quad \oplus = 1
 \end{array}$$

$$b. \quad \Phi \ \Omega \ \oplus = 16$$

$$c. \quad 56 \Rightarrow \Phi \ \Phi \ \Phi \ \Phi \ \Omega \ \Omega \ \oplus \ \oplus$$

$$\begin{array}{l}
 42. \quad \text{In 1994} \\
 \quad \quad \text{David } 24 \rightarrow \text{Peta } 24 \div 4 = 6 \\
 \quad \quad \text{"Double" ages} \\
 \quad \quad \text{David } 36 \ \& \ \text{Peta } 18 \\
 \quad \quad \text{Peta born } 1994 - 6 = 1988 \\
 \quad \quad \underline{\text{Answer}} \ 21^{\text{st}} \text{ in } 2009
 \end{array}$$

$$\begin{array}{l}
 43. \quad \text{'Rest'} \quad 1/2 \div 4 = 1/8 \\
 \quad \quad 3/8 \text{ used for the 'rest'} \\
 \quad \quad 1/8 \text{ of wood left} = 15\text{cm} \\
 \quad \quad 8 \times 15 \Rightarrow 120\text{cm originally}
 \end{array}$$

$$\begin{array}{l}
 44. \quad \text{Previous year} \\
 \quad \quad 25 \text{ boys} + 15 \text{ girls} \\
 \quad \quad \text{New season} \\
 \quad \quad 52 - 40 = 12 \\
 \quad \quad \Rightarrow 3 \text{ boys} + 9 \text{ girls} \\
 \quad \quad \text{Overall} \\
 \quad \quad 28 \text{ boys} + 24 \text{ girls}
 \end{array}$$

$$\begin{array}{l}
 45. \quad \text{Stephanie's expenditure} \\
 \quad \quad - \$2600 \quad + \$3000 \\
 \quad \quad - \$4000 \quad + \$5200 \\
 \quad \quad \text{Overall profit} = + \$1600
 \end{array}$$

$$\begin{array}{l}
 46. \quad 6 \times 7 \times 8 = 336 \\
 \quad \quad 46 + 47 + 48 = 141
 \end{array}$$

$$\begin{array}{l}
 47. \quad \text{Overall handshakes} \\
 \quad \quad 1^{\text{st}} \text{ person has } 5 \text{ handshakes} \\
 \quad \quad 2^{\text{nd}} \text{ per. } 4 \text{ 'new' handshakes} \\
 \quad \quad \quad \quad [1 \text{ is already counted}] \\
 \quad \quad 3^{\text{rd}} \text{ per. } 3 \text{ 'new' handshakes} \\
 \quad \quad \quad \quad [2 \text{ are already counted}] \\
 \quad \quad \Rightarrow 5 + 4 + 3 + 2 + 1 + 0 = 15 \\
 \quad \quad \text{Answer} = 6 \text{ guys}
 \end{array}$$



48. "Guess & revise" or algebra
 x = cost of top in pounds
 $x + (x - 30) + (x + 15) = 150$
 $3x - 15 = 150$
 $3x = 165$, so $x = 55$
 Top £55
 Shorts £25
 Shoes £70
49. Chris 17
 [prime number]
 Robert 60
 [factors 2 3 4 5 6...]
 $60 - 17 = 43$ years
50. Overall
 Distance $370 \times 2 = 740\text{m}$
 Time $6 \text{ hr} + 2 \text{ hr} = 8 \text{ hrs}$

 Speed = distance \div time
 $740 \text{ km} \div 8 \text{ hours} =$
 92.5 mph
51. Arithmetic reasoning
 $\leftrightarrow = 1$ $\updownarrow = 5$
 $\updownarrow = 2$ $\blacksquare = 6$
 $\text{☎} = 3$ $\text{◎} = 7$
 $\text{☪} = 4$ $\text{☺} = 8$
52. $120 \div 5 = 24$ [median]
 $\Rightarrow 3^{\text{rd}}$ hour = median = 24
 1^{st} hour = 40
 2^{nd} hour = 32
 3^{rd} hour = 24
 4^{th} hour = 16
 5^{th} hour = 8

53. Frame
 Length [symmetrical] =
 $2+7+3+7+2=21 \text{ cm}$
 Width = 10 cm
 Area of frame = $L \times W$
 $\Rightarrow 21 \times 10 = 210 \text{ cm}^2$
Photo sections
 Area = $(7 \times 7) \times 2 = 98 \text{ cm}^2$
Answer
 $210 \text{ cm}^2 - 98 \text{ cm}^2 = 112 \text{ cm}^2$
54. pp. 1 \rightarrow 9 = 9 digits
 pp. 10 \rightarrow 19 = 20 digits
 $9 + (4 \times 20) = 89$ digits
 $\Rightarrow 49$ pages in total
55. "Guess & revise"
 Verity was 15 & dad 45
 Verity is 30 & dad 60
 When _ ages 9
 Verity 90 & dad 120
 Unlikely they will be this
 old together.
56. Pattern
 1^{st} game = 0 goals
 2^{nd} game = 1 goal
 3^{rd} game = 2 goals
 $0 + 1 + 2 + 3 \dots + 14 =$
 105 goals
 100 goals in 15^{th} game
57. "Guess & revise"
 $2 \times 20\text{p} = 40\text{p}$
 $4 \times 10\text{p} = 40\text{p}$
 $4 \times 5\text{p} = 20\text{p}$



58.

8	1	6
3	5	7
4	9	2

59.

1st half
 5 miles x 3 = 15m
 2nd half
 5m x 2 = 10m
 ⇒ Jack ran 25 miles

60.

Desk Area
 72 x 134 = 9648 cm²
Maureen's side
 9648 cm² ÷ 2 = 4824 cm²
 Subtract books area
 4824 cm² - (30 x 15)
 ⇒ 4374 cm²
Answer
 4374 marbles

61.

Beautiful People
 8 correct x 5 - 2 wrong x 2
 = 36 points
Magical Wizards
 7 correct x 5 - 3 wrong x 2
 = 29 points

62.

Work in reverse
 Fido £100
 Boys £300 x 3 = £900
 Girls £600 x 3 = £1800
 Niece/nephew (£2700 x 2) x 2
Total ⇒ £13,600

63.

Peta 18
 Sasha 12
 Tomi 8

64.

6	7	x	7	6
x	6	5	3	1
2	6	5	x	9
8	1	5	9	x
4	x	5	1	4

65.

4 packs + 3 1/2 lots =
 4 packs + 70 chocolates
 Therefore
 4 packs = 70 chocolates
 ⇒ 1 full pack = 20 chocolate

66.

Taking on
 15 ÷ 5 = 3 litres per minute
 Bailing at 2 litres per minute
 ⇒ Boat takes 1 L per minute
Answer 1
 In 97th minute, because we
 add 3 litres to 97L ⇒ 100L
Answer 2
 In 100th minute because
 we don't know the ratio
 of taking on water v. bailing

67.

6 x 8 ÷ 4 = 12
 3 x 8 ÷ 6 = 4
 4 x 9 ÷ 2 = 18

68.

Total goals
 11 + 12 + 9 + 8 = 40
Total games
 3 + 11 + 6 + 3 + 2 = 25
Answer
 3+ goals in 5 games
 5 out of 25 = 1/5

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69. Process of elimination
Mystery number is 71
70. Create a list
[22 heads → 64 legs]
- | <u>Giraffes</u> | <u>Flamingoes</u> | <u>Legs</u> |
|-----------------|-------------------|-------------|
| 1 | 21 | 46 |
| 2 | 20 | 48 |
| 3 | 19 | 50 |
| 10 | 12 | 64 |
- Answer
10 giraffes 40 legs
12 flamingoes 24 legs
71. $189 \div 3 = 63$
Answer
63 boys chose water polo
126 boys chose cricket
72. Work in reverse
a. $((20 + 16) \div 2) \div 2 = 9$
b. $((12 \times 3) - 16) \times 5 = 100$
c. $((2 \times 4) \times 2) \times 8 = 128$
73. June = $19^\circ\text{C} \times 30 = 570^\circ\text{C}$
July = $22^\circ\text{C} \times 31 = 682^\circ\text{C}$
Aug. = $25^\circ\text{C} \times 31 = 775^\circ\text{C}$
Answer
Total temperatures = 2027°C
Yes it was hot enough.
74. Rule
top number $\div 6$ then $+ 4$
Work in reverse
 $(16 - 4) \times 6 = 72$
Apply rule
 $12 \div 6 + 4 = 6$
Work in reverse
 $(14 - 4) \times 6 = 60$

75. 60 swap cards
 $60 \div 5 = 12$
Therefore
48 horse & 12 dog
Probability of gold horse cards
 $1/4$ of 48 = 12
76. "Guess & revise"
50 dogs \times £10 = £500
40 cats \times £5 = £200
90 birds \times £2 = £180
Answer 180 animals for £880
77. "Guess & revise"
Steve 42
Jenny 36
Jilly 12
Sam 10
- 78.
- | | | | | |
|----|----|----|----|----|
| - | 30 | 14 | 23 | 17 |
| 9 | 21 | 5 | 14 | 8 |
| 14 | 16 | 0 | 9 | 3 |
| 3 | 27 | 11 | 20 | 14 |
79. $550 \div 4 = 137.5$ median
Above median
Darcy $137.5 + 7.5 = 145$
Claire $145 + 15 = 160$
Below median
Madeleine $137.5 - 7.5 = 130$
Jean $130 - 15 = 115$
80. Set up a costs table
Answer
4 old \times £40 = £160
3 new \times £50 = £150
 \Rightarrow 7 games for £310



E81. Example years
111, 181, 808, 818
1001, 1111, 1881

E82. $2 \prod r = c$
 $2 \times \prod x \times 15\text{cm} = 94.25\text{cm}$
 $94.24 \times 240 \text{ rotations}$
 $= 226.2 \text{ metres}$

E83. Colour choices
Quadrant 1 \rightarrow 4 choices
Quadrant 2 \rightarrow 3 choices
Quadrant 3 \rightarrow 2 choices
Quadrant 4 \rightarrow 1 choices
 $4 \times 3 \times 2 \times 1 \Rightarrow 24$
combinations of flags

E84. A = 3, 6 or 9
B = 2, 4 or 6
C = 1, 2 or 3

E85. "Guess & revise" or algebra
Let golf balls cost x pounds
 $4x + 2x = \text{£}36$
 $\Rightarrow x = \text{£}6$
Therefore
Golf balls $4x \Rightarrow \text{£}24$
 $\text{£}24 \div 50\text{p} = 48$ golf balls
Tennis balls $[2x] \Rightarrow \text{£}12$
 $\text{£}12 \div \text{£}1 = 12$ tennis balls
Total
60 balls for $\text{£}36$

E86. Process of elimination
Mystery number = 31872

E87. $120 \text{ min} \div 10 \text{ min} = 12$ buses

12 buses, because they will pass all buses departing within their two hour travelling time.

E88. Working out combinations
 $2 \times 5 \times 2 = 20$ routes
 1^{st} fence = 2 holes
 2^{nd} fence = 5 holes
 3^{rd} fence = 2 holes

E89. Arithmetic reasoning
 $10 \times 10 = 100$
 $\infty = 0$
 $\text{£} = 1$
 $\Omega = 2$
 $\otimes = 4$
 $\# = 5$

E90a. $157 + 163 + 167 = 487$
b. $16 \times 17 \times 18 = 4896$

Challenges 91 \rightarrow 100

These are open-ended questions, with no set solutions. Please refer to introductory sheet 3 for a thorough explanation.