

## Resource Pack for Primary Schools Answers

Answers to questions are listed in the order they appear from top to bottom on the Resource Sheet.

### PA3: Money Round Questions

- £5.10     4 weeks     £76.80     £45.60     £14.40  
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### PA9: Countdown

- $3 \times 100 = 300.$      $300 - (9 + 10) = 281.$
- $(3 \times 100) + (6 \times 8) = 348.$
- $(50 - 10) \times 3 = 120.$      $120 + 100 - (9 - 7) = 218.$
- $75 - 9 = 66.$      $8 + 6 = 14.$      $66 \times 14 = 924.$      $924 + 2 = 926.$
- $75 \times 3 = 225.$      $225 + (1 + 5 + 8 + 9) = 248.$
- $(100 + 5) \times 4 = 420.$      $420 + 9 - (6 - 2) = 425.$   
or  $(100 + 6) \times 4 = 424.$      $2 \times 5 - 9 = 1.$      $424 + 1 = 425.$
- $(7 + 1) \times 50 = 400.$      $4 \times 5 + 7 = 27.$      $400 + 27 = 427.$
- $(6 - 2) \times 25 = 100.$      $(100 + 8 - 1) \times 5 = 535.$
- $4 \times 75 - (3 + 3 + 6) = 288.$     or  $4 \times 75 - (10 + 6 \div 3) = 288.$   
or  $(75 - 3) \times 4 = 288.$
- $6 \div 3 = 2.$      $50 \times 10 \times 2 - 4 = 996.$     or  $(50 \times 10) \times (3 - 1) - 4 = 996.$   
or  $(10 + 3 + 6 + 1) \times 50 = 1000.$      $1000 - 4 = 996.$
- $(1 + 3) \times 100 - 4 \times 4 = 386.$     or  $(100 - 4) = 96.$      $96 \times 4 = 384.$   
or  $4 \times 100 - (3 - 1) \times 8 = 384.$
- $100 + 10 + 10 + 9 - (3 + 1) = 125.$

13.  $(100 - 1) \times (8 + 2) = 990$ .
14.  $(8 - 1) \times 100 + 6 + 5 = 711$ .
15.  $(10 + 2) \times 50 = 600$ .  $600 - (10 + 5 - 2) = 587$ .
16.  $3 \times 6 = 18$ .  $18 + 1 + 75 = 94$ .  $94 \times 7 = 658$ .
17.  $(2 \times 50) + (5 \times 4) + 8 + 1 = 129$ .
18.  $8 + 7 + 5 = 20$ .  $20 \times 50 = 1000$ .  $1000 - (7 + 3) = 990$ .  
or  $7 \times 50 = 350$ .  $350 - (8 + 5 + 7) = 330$ .  $330 \times 3 = 990$ .
19.  $(9 - 2) \times 75 = 525$ .  $525 + 6 - 1 = 530$ .
20.  $(9 + 3) \times 75 = 900$ .  $900 + 7 - 5 + 4 = 906$ .
21.  $4 \times 6 + 75 = 99$ .  $99 + 8 + 2 = 109$ .  
or  $8 \times 4 = 32$ .  $32 + 75 + 2 = 109$ .
22.  $7 \times 100 = 700$ .  $700 - (9 + 6) = 685$ .
23.  $9 + 7 + 4 + 3 = 23$ .  $23 \times 25 = 575$ .  $575 - 1 = 574$ .
24.  $(50 + 10) \times (1 + 6) = 420$ .  $420 + 5 = 425$ .  
or  $10 \times 3 = 30$ .  $30 + 6 - 1 + 50 = 85$ .  $85 \times 5 = 425$ .
25.  $7 \times 9 = 63$ .  $63 + 2 = 65$ .  $65 \times 5 = 325$ .  $325 \times 3 = 975$ .
26.  $(100 - 9) \times 7 = 637$ .  $637 - (9 - 8 + 1) = 635$ .
27.  $(7 + 1) \div (8 - 6) = 4$ .  $4 \times 75 = 300$ .  $300 - 10 = 290$ .
28.  $4 \times 6 - 3 = 21$ .  $21 \times 25 = 525$ .  $525 + 4 + 7 = 536$ .
29.  $(8 \times 75) = 600$ .  $600 + 1 + 2 = 603$ .
30.  $(75 - 2) \times 3 = 219$ .  
or  $3 \times 75 = 225$ .  $225 - 6 = 219$ .
31.  $(9 + 3) \times 50 = 600$ .  $600 + 7 = 607$ .
32.  $(9 + 2) \times 50 = 550$ .  $550 - 7 - 5 = 538$ .
33.  $(100 + 9) \times (8 + 1) = 981$ .  $981 + 3 = 984$ .  
or  $100 - 3 = 97$ .  $97 \times (9 + 1) = 970$ .  $970 + 6 + 8 = 984$ .

34.  $(3 + 6) \times 100 = 900$ .  $2 \times 3 + 900 = 906$ .  
or  $3 \times 3 \times 100 = 900$ .  $900 + 6 = 906$ .
35.  $3 \times 9 = 27$ .  $27 - 6 + 50 = 71$ .  $71 \times 9 = 639$ .
36.  $3 \times 6 \times 50 = 900$ .  $900 - 9 = 891$ .  
or  $50 \times 2 - 1 = 99$ .  $99 \times 9 = 891$ .
37.  $7 \times 50 = 350$ .  $350 - 4 \times 9 - 9 = 305$ .  $305 \times 3 = 915$ .
38.  $3 \times 6 \times 50 = 900$ .  $(9 - 5) \times 10 = 40$ .  $900 + 40 = 940$ .
39.  $(4 + 3) \times 25 = 175$ .  $175 + 10 - 4 = 181$ .
40.  $100 + (4 + 4 + 2 + 8) = 118$ .  $118 \times 3 = 354$ .  
or  $(100 - 8 - 4) = 88$ .  $88 \times 4 = 352$ .  $352 + 2 = 354$ .
41.  $(8 \times 75) - (7 \times 7) = 600 - 49 = 551$ .  
or  $7 \times 75 = 525$ .  $(6 + 3) \times 2 = 26$ .  $525 + 26 = 551$ .
42.  $2 \times 4 \times 50 = 400$ .  $9 + 9 - 5 = 13$ .  $400 - 13 = 387$ .
43.  $4 \times 6 = 24$ .  $24 \times 25 = 600$ .  $600 + 8 = 608$ .
44.  $(7 - 4) \times 75 = 225$ .  $8 \times 5 = 40$ .  $225 + 40 + 9 = 274$ .
45.  $75 - 3 - 1 = 71$ .  $71 \times 9 = 639$ .  $639 + 7 - 1 = 645$ .
46.  $3 \times 10 + 1 + 1 = 32$ .  $32 \times 4 = 128$ .
47.  $8 \times 100 = 800$ .  $800 + 7 + 7 = 814$ .
48.  $3 \times 75 = 225$ .  $50 + 10 + 225 = 285$ .  
or  $3 \times 100 = 300$ .  $25 - 10 = 15$ .  $300 - 15 = 285$ .
49.  $(100 - 6) \times 8 = 752$ .  $752 + 4 + 3 = 759$ .
50.  $7 + 2 = 9$ .  $9 \times 9 \times 10 = 810$ .  $810 - 5 = 805$ .
51.  $2 \times 10 = 20$ .  $(20 + 2) \times 8 = 176$ .  $176 + 3 = 179$ .  
or  $8 \times 2 + 2 = 18$ .  $18 \times 10 = 180$ .  $180 - 1 = 179$ .
52.  $3 \times 75 = 225$ .  $225 - 25 - 10 = 190$ .  
or  $25 - 6 = 19$ .  $19 \times 10 = 190$ .



$a = 5$ and $b = 3$															
Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
O.K.?			✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Useless?	✓	✓		✓			✓								

$a = 5$ and $b = 4$															
Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
O.K.?				✓	✓			✓	✓	✓		✓	✓	✓	✓
Useless?	✓	✓	✓			✓	✓				✓				

$a = 5$ and $b = 5$															
Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
O.K.?					✓					✓					✓
Useless?	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	

4. The results for  $a = 5$  and  $b = 5$  are very easy to understand. The only possible **O.K.** numbers are multiples of 5.

$a = 5$ and $b = 6$													
Number	1	2	3	4	5	6	7	8	9	10	11	12	
O.K.?					✓	✓					✓	✓	✓
Useless?	✓	✓	✓	✓			✓	✓	✓				
Number	13	14	15	16	17	18	19	20	21	22	23	24	
O.K.?			✓	✓	✓	✓		✓	✓	✓	✓	✓	
Useless?	✓	✓					✓						

5. There are many patterns which occur in the tables, like clusters of **O.K.** and **Useless** numbers.
6. If the student is at all unsure about what will happen for  $a = 5$  and  $b = 7$ , then he should make a table similar to the ones which have gone before.
7. The most easily understood explanation of the fact that there seems a point beyond which there are no more **Useless** numbers relies on the clusters of **O.K.** numbers. Once there are five in a row you can easily produce the next number by taking the first of the cluster of five **O.K.** numbers and adding 5 to it.
8. The final **Useless** number for  $a = 5$  and  $b = 8$  is 27.
9. It is a good idea to collect the results in a chart before looking for the connection.

$a$	5	5	5	5	5	5	5	5	5
$b$	2	3	4	5	6	7	8	9	10
last <b>Useless</b> number	3	7	11	?	19	23	27	31	?

The connection between  $a$ ,  $b$  and the last **Useless** number is  $a \times b - (a + b)$ . So for  $a = 5$  and  $b = 8$  it is  $5 \times 8 - (5 + 8) = 40 - 13 = 27$

10. It is worth suggesting an investigation where the two available notes have a common divisor. For example  $a = 6$  and  $b = 4$  will provide a completely different type of result as both  $a$  and  $b$  are multiples of 2.

**PA14: Morse Code**

If a dot takes one second to send then a dash takes 3 seconds

Length of time taken to send each letter in Morse code.

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Time	5	9	11	7	1	9	9	7	3	13	9	9	7	5	11	11	13	7	5	3	7	9	9	11	13	11

Analysis of text

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M
Total	15	6	8	8	24	3	8	14	22	0	3	2	0
Letter	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Total	20	24	4	0	14	15	25	6	4	5	0	2	0

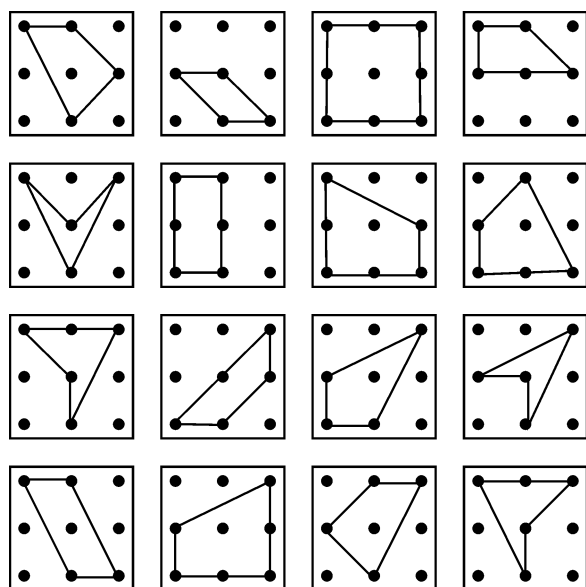
Most popular letters in the text

Letter	T	E	O	I	N	A	S	R	H	C, D, G (10th equal)
Time to send	3	1	11	3	5	5	5	7	7	11, 7, 9

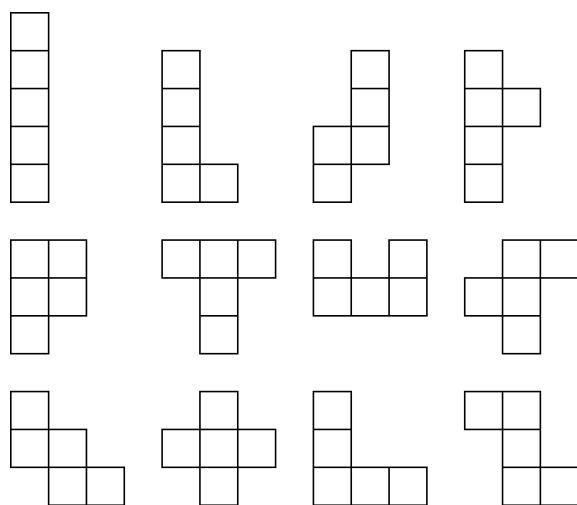
In the passage provided, the letter T is the most common, with E and O in second place. In general use, the letter E is the most common letter. Discussion points could include: Is the passage provided a suitable example of a message that would be sent? Is it a large enough sample on which to base the design of a code?

**PA37: Quadrilaterals**

Example solution.



**PA38: Pentominoes**



**PA39: Targets**

Examples of solutions:

1.  $6 \times 5 + 3 - 2 = 31$
2.  $7 \times 4 + 2 - 5 = 25$
3.  $(8 - 3) \times 7 + 6 = 41$
4.  $2 \times 5 + 9 + 4 = 23$
5.  $(6 + 8) \times 3 + 9 = 51$

6.  $(7 \times 4 - 3) \times 2 = 50$
7.  $9 \times 6 - 4 + 7 = 57$
8.  $(8 \times 5 - 2) \times 3 = 114$
9.  $(9 - 3) \times 2 + 7 = 19$
10.  $6 \times 8 - 7 \times 4 = 20$
11.  $(5 \times 4 + 8) \times 3 = 84$
12.  $7 \times 8 + 2 - 3 = 55$

**PA42: Mirror Alphabet**

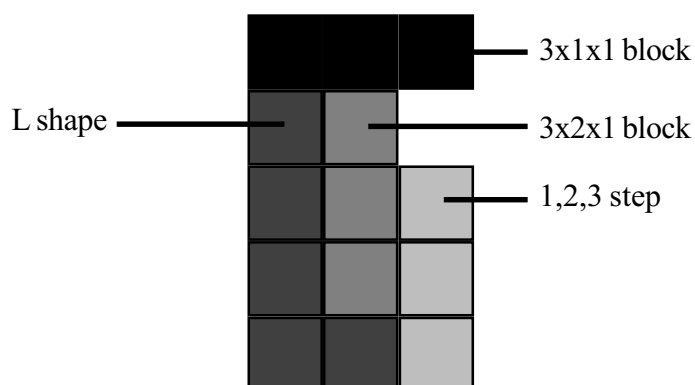
- 1 B, C, D, E, H, I, K, O, X
- 3 A, H, I, M, O, T, U, V, W, X, Y

**PA46: Questions and Pyramid Puzzle**

- $3 + 3 + 3 + 3 = 12$        $3 \times 3 \times 3 \times 3 = 81$
- 80m
- T E N      or      □ 1 □
- Make the 1,2,3 step piece the centre of the pyramid, with the 1 cube the top of the pyramid.

Add the L shape, the 3x2x1 block and one of the 3x1x1 blocks as follows:

Top view:



The other pieces fit easily in the remaining gaps.