Being Naturally Mathematical at Easter time: Upper Primary Solutions

These solutions show how mathematical problem solving can be enhanced using spreadsheets. The spreadsheet ***2018 Upper Solutions.xls*** gives the full solutions; this document discusses how the spreadsheets were put together.

Question 2

The restriction that the python cannot be drape across a corner of a square means that many of the possible solutions will be made with two pairs of consecutive numbers. To find out what the possibilities are, we can make a spreadsheet that starts by listing the sum of two consecutive numbers, 1 + 2, 2 + 3 and so on. The list that we make can be turned into the top and side row of a table where we can add the lists and use conditional formatting to highlight where the possibilities lie.

1	2	3
2	3	5
3	4	7
4	5	9
5	6	11
6	7	13
7	8	15
8	9	17
9	10	19
10	11	21
11	12	23
12	13	25
13	14	27
14	15	29
15	16	31

	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31
3	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
5	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
7	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38
9	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
11	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
13	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44
15	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
17	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
19	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
21	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
23	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
25	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56
27	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58
29	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
31	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62

The table suggests that we might be able to use the numbers 1 and 2 with 13 and 14 to make a solution, but it seems that that combination is impossible. The same happens numbers 2, 3, and 12, 13 but with the next combination 3, 4 and 11, 12 a solution is possible.

10	9	8	7
11		1	6
12		2	5
		3	4

11			
10		2	1
9		3	4
8	7	6	5

14	15	16	1
13	12	3	2
10	11	4	5
9	8	7	6

We also found that the remaining pairs (up to 6, 7 with 8, 9) made for acceptable solutions.