

Stage 3 ★
Mixed Selection 1

1. Street lamps

Walking up a steep hill, I pass 10 equally spaced street lamps. I take 5 seconds to walk from the first lamp to the second lamp, 6 seconds from the second lamp to the third, and so on, with each time increasing by 1 second as I slow down. How long do I take to walk from the first lamp to the last?

2. Printing error

A book has 89 pages, but the page numbers are printed incorrectly. Every third page number has been omitted, so the pages that are printed out are numbered 1,2,4,5,7,8,...and so on. What is the number on the last printed page (the 89th page of the book)?

3. Luis' Seven

Luis writes down seven consecutive positive integers. The sum of the three smallest numbers is 33. What is the sum of the three largest numbers?

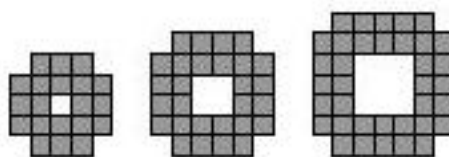
4. Mean Sequence

The first two terms of a sequence are $\frac{2}{3}$ and $\frac{4}{5}$. Each term after the second term is the mean of the two previous terms. What is the fifth term in the sequence?

5. Expanding pattern

The diagram shows the first three patterns in a sequence in which each pattern has a square hole in the middle.

How many small shaded squares are needed to build the tenth pattern in the sequence?



6. Fruit line-up

A grocer places some oranges, peaches, apples and bananas in a row so that, somewhere in the row, each type of fruit can be found next to each other type of fruit. What is the smallest possible number of fruits in the row?

These problems are adapted from UKMT Mathematical Challenge problems (ukmt.org.uk).