

<https://www.geogebra.org/classic/zfxp4kdg>

1. From the **table** a student could look for an emerging pattern. By examining the first change (as previously done for linear patterns) the student should be able to conclude that the pattern is non linear. The student may notice (from investigation or as a result of appropriate support questioning) that there is an emerging pattern from the rate of change of the change.
2. Is it sufficient to consider the **graph** alone? Would a student be convinced that by examining only the graph that the progression is non linear? The student may need to compare this graph to a linear graph (or examine the table) before concluding definitively that this pattern does not follow a linear progression. The conversation around the discrete nature of the graph may also need to be revisited.

On the **spreadsheet** we can drag the formula to make this prediction a little easier but for larger values students should see the need for a better approach to making this prediction.

This motivates the need for introducing the new **algebra**.

We would spend time investigating the fact that the algebra looks a bit different and the relationship between the quadratic expression and the product of two linear expressions. (expressions of the form $mx+c$ multiplied), the graph is different (non-linear), the table backs this up (non constant increase in y for unit increase in x). It might emphasise the continuity between linear and quadratic and the application of the skills/habits developed in linears to understand this new relationship.