

## RESEARCH STATEMENT

### Original Creative Work

**Citation:** Noel Patson 2009, Recorded or Rendered Work, Web Exhibition, *Ways of Stepping One Two or Three Stairs Up a Stairway* Wolfram Mathematica.

<http://demonstrations.wolfram.com/WaysOfSteppingOneTwoOrThreeStairsUpAStairway/>

### Research Background

For a person who can climb stairs either one, two, or three stairs at a time there are many ways of climbing a stairway with  $n$  stairs. For a stairway consisting of four stairs, there are the following seven ways:

$\{\{1,1,1,1\}, \{1,1,2\}, \{1,2,1\}, \{2,1,1\}, \{2,2\}, \{1,3\}, \{3,1\}\}$ .

The demonstration shows the combinations and counts the permutations of these combinations for stairways of different lengths. It also shows a simpler way of finding the number of different ways of climbing the stairways using the Tribonacci series.

### Research Contribution

- Innovation – This demonstration is a fresh approach to presenting the Tribonacci series. It should appeal to visual and kinesthetic learners

### Research Significance

The demonstration has been through a rigorous review process<sup>†</sup>.

<sup>†</sup> <http://demonstrations.wolfram.com/FAQ.html>

A link to this demonstration can be found at this website:

<http://mathworld.wolfram.com/TribonacciNumber.html>

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