Mathematical investigation (1)

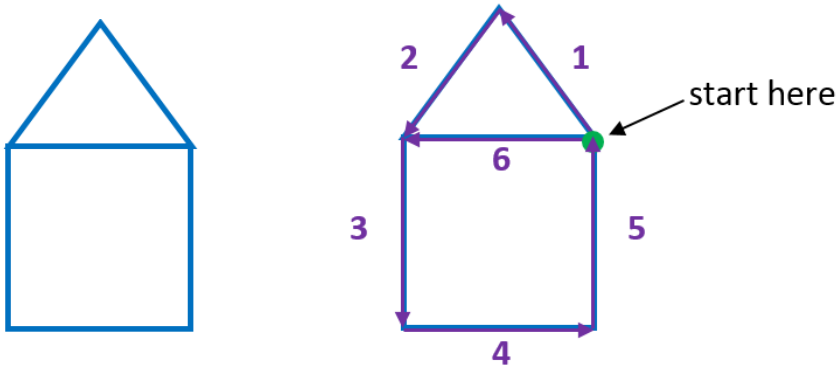
Investigating is a great way to learn to think mathematically, apply logic, spot patterns and improve our perseverance.

Don't lift your pencil!

> *"Begin at the beginning," the King said gravely, "and go on until you come to the end; then stop."*
> Lewis Carroll, *Alice's Adventures in Wonderland*

Lewis Carroll (who wrote Alice's Adventures in Wonderland) loved maths puzzles. One puzzle he enjoyed was trying to work out how to draw over a diagram **without** lifting his pencil or going over a line twice.

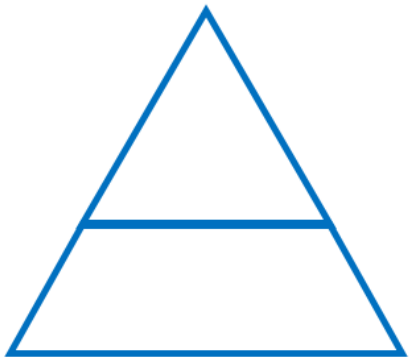
For example:



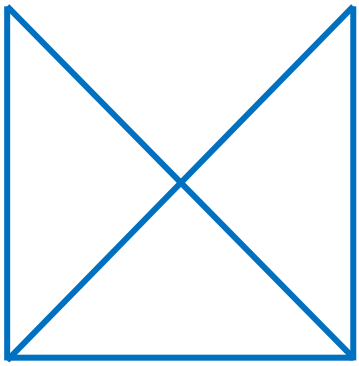
Can you find another way of solving this puzzle?

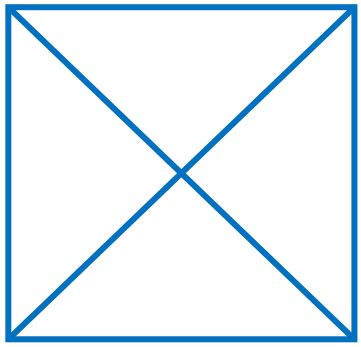
You can start anywhere you like... But remember, you can't draw over a line twice and you can't lift your pencil until you've finished!

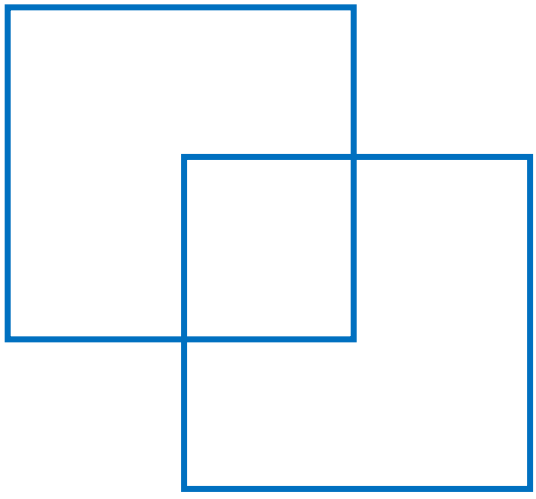
Now try these diagrams. Four are possible and one isn't! Can you work out which is which?

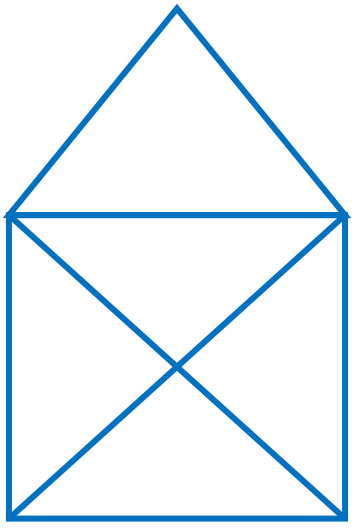


Tip! Copy each diagram onto paper so you can have as many tries as it takes.









Challenge!

1. How many CAPITAL letters do you think are possible to draw without taking your pencil off? For example **A** is not possible, but **B** is. Investigate!

2. Do you think you've spotted any patterns or rules about the type of shapes that 'work' and those that don't…? Ask someone to help you write them down.