In the diagram below, each "path" from top to bottom correctly spells the word MATCH. What is the total number of different paths in the diagram?

```
          M

      A       A

   T      T      T

      C       C

          H
```
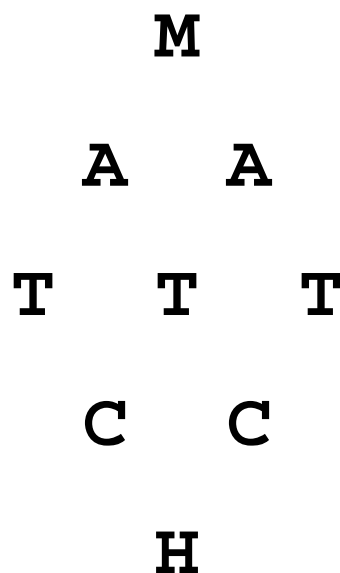
Solution: 12 paths.

To spell the word MATCH, there is one way to choose the M, two ways to choose an A, three ways to choose a T, two ways to choose a C, and one way to choose the H. That results in a total of 1 × 2 × 3 × 2 × 1 = 12 possible paths.

Several sample paths are shown below.